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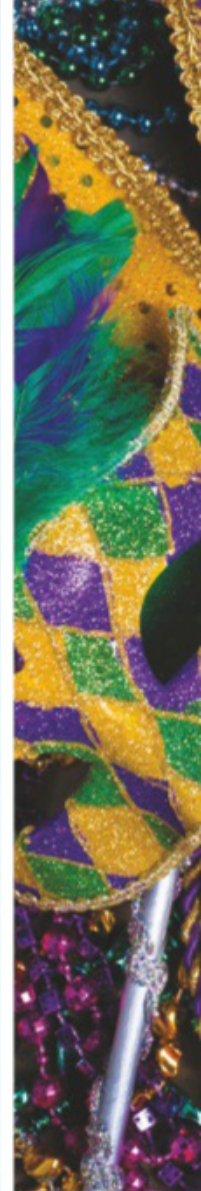
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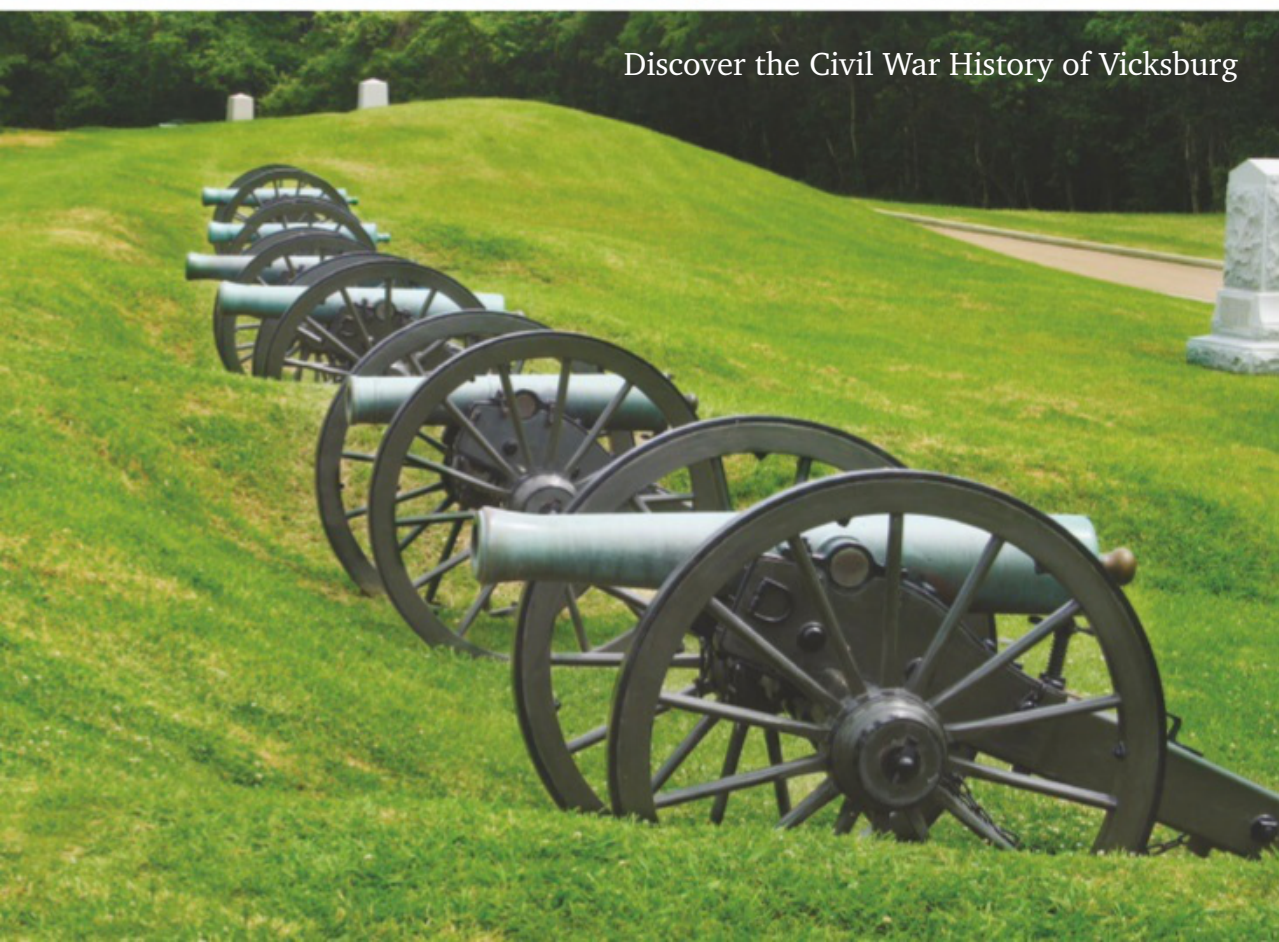
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C.

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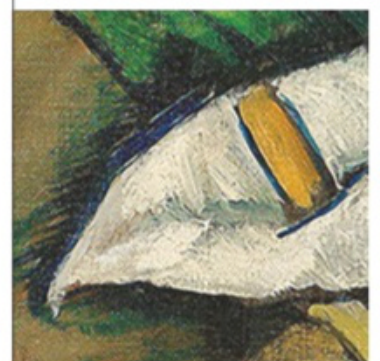
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We've got experts

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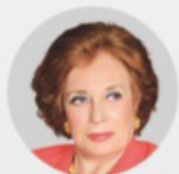
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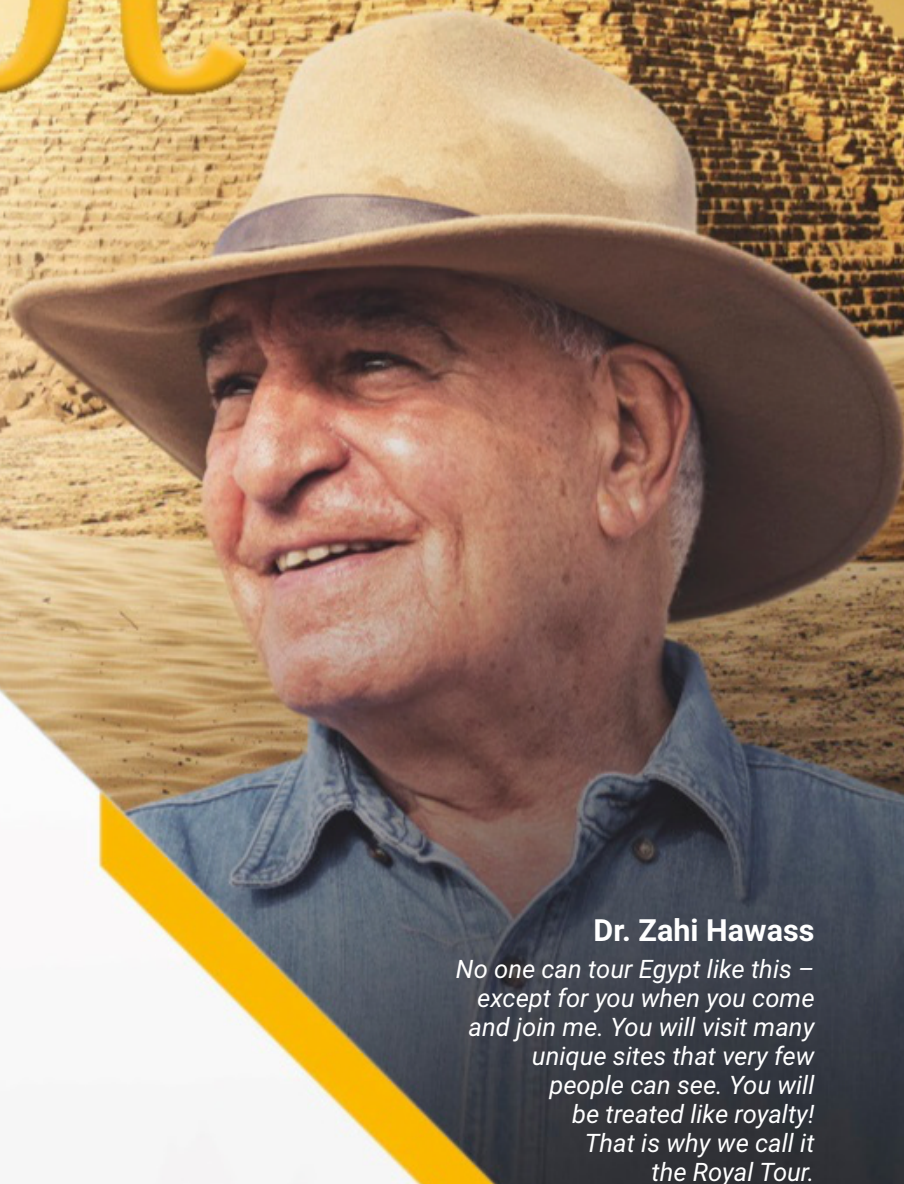
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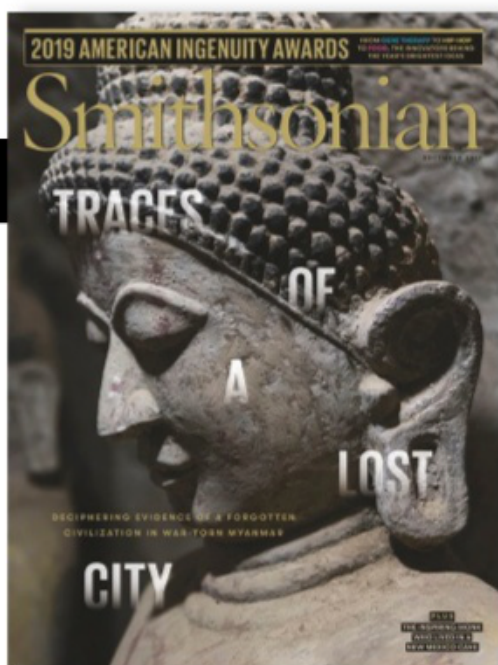
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“Figuring out a clue sharpens my intuition, memory and appetite for life.”

Constitutional Clarity

I have long known that our Constitution (“The Funny Thing About the Law,” December 2019) was created and written by white men, but I never truly appreciated how dramatically it excluded everybody else. Ms. Schreck paints a brilliant picture and does it extraordinarily well. Thanks for the opportunity to enjoy it.

— **Jon M. Jumper** | Santa Ana, California

Invigorating Crosswords

“Block Party” (December 2019) by Deb Amlen and Sam Ezersky, tracing the development of the crossword puzzle, brought a smile to my face. I am one of many who daily solve crosswords for personal entertainment, mental stimulation, and because, as the authors point out, it helps work through self-doubts by forging order out of chaos. Figuring out a clue sharpens my intuition, memory and appetite for life. Educators should include crosswords in their teaching lessons by homing in on key concepts

and ideas; it will make their students’ homework come alive in captivating ways.

— **Vasilios Vasilounis** | Brooklyn, New York

American Architect

Fallingwater is a gem (“In the American Grain,” December 2019). I was amused by the fact that the ceilings are lower than one would expect: A docent told us that Wright’s belief was “anyone 6 feet tall was a weed.”

— **Betty Ford** | Facebook

The Hermit’s Dwelling

I recently visited the cave that was the last home of the hermit Giovanni Maria de Agostini (“Blessed Is the Hermit,” December 2019). It’s a solemn and stunning place to contemplate his story. I would urge all adventurers who love the outdoors and mountains to enjoy this beautiful area, but also the sadly profound last home of a truly life-embracing man.

— **Aaron Taylor** | Houston

Misrepresenting Che

“Che’s Kid Hits the Road” (November 2019) presents a distorted image of Guevara as a “soulful, poetic introvert.” The real Che is at the Cuba Archive, with victims’ names and dates. At the Sierra Maestra (1959) he ordered 79 summary executions. At the U.N. in 1964 he responded to a question: “Executions? Yes, we have executed, we are executing, and we will continue to execute.” In his diary (January 1957) he writes: “Here, in the Cuban jungle, alive and thirsting for blood.” At Fort La Cabaña he showed how he ignored due process when he said: “The investigating officer is always right; he always has the truth.” In spite of widespread Cuban poverty today, Che’s son has access to “a dozen shiny new Harleys.” The author, Tony Perrottet, whitewashes the blood of innocents whom Che executed without due process by calling them “Batista’s thugs,” which most of them were not. “Heroic guerrillas” don’t have carte blanche to murder in the name of the revolution.

— **Aida Levitan** | chair, Facts About Cuban Exiles, Miami

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THE PAST IS

prologue

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AMERICAN ICON



Courageous

Maya Angelou's breakthrough memoir, published 50 years ago, launched a revolution in literature and social awareness

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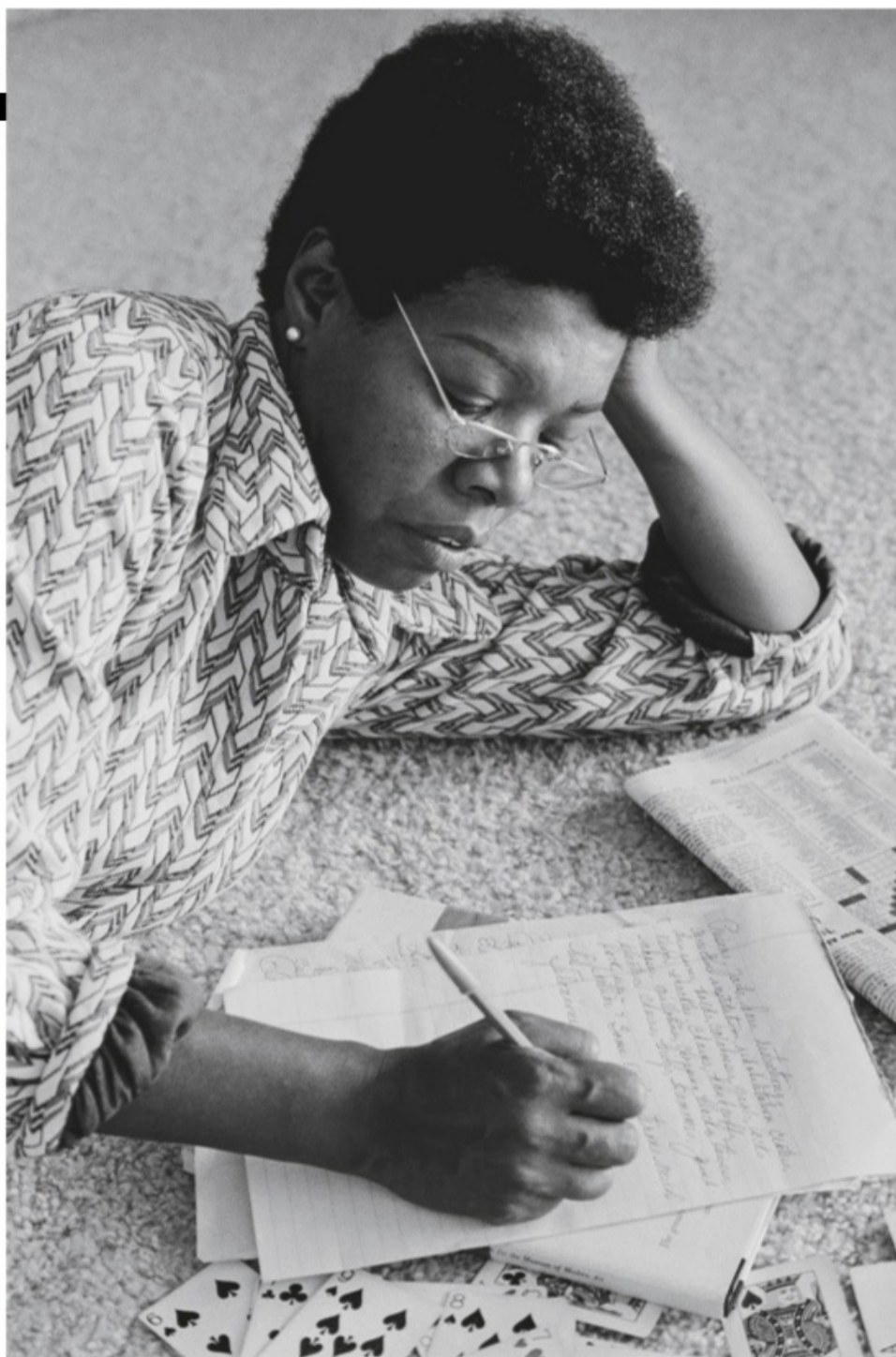
AYA ANGELOU PUBLISHED the first of her seven memoirs not long after she distinguished herself as the star raconteur at a dinner party. “At the time, I was really only concerned with poetry, though I had written a television series,” she would recall. James Baldwin, the novelist and activist, took her to the party, which was at the home of the cartoonist-writer Jules Feiffer and his then-wife, Judy. “We enjoyed each other immensely and sat up until 3 or 4 in the morning, drinking Scotch and telling tales,” Angelou went on. “The next morning, Judy Feiffer called a friend of hers at Random House and said, ‘You know the poet Maya Angelou? If you could get her to write a book . . .’”

That book became *I Know Why the Caged Bird Sings*, which recently celebrated its 50th birthday.

In the memoir, Angelou (born Marguerite Johnson) boldly told the heartbreaking truths of her childhood, including how she was raped at the age of 7 by her mother’s boyfriend. She would later explain, “I stopped speaking for five years. In those five years, I read every book in the black school library. When I decided to speak, I had a lot to say.”

One of the women who helped Angelou find her voice was a teacher in Stamps, Arkansas, named Bertha Flowers. She was the kind of woman you rarely got to read about in American literature in the 1960s. Angelou’s writing is cinematic; in *Caged Bird*, she transports the reader to another time:

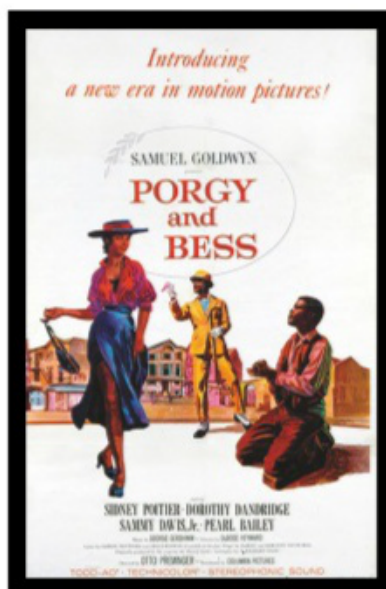
Mrs. Bertha Flowers was the aristocrat of Black Stamps. She had the grace of control to appear warm in the coldest weather, and on the Arkansas summer days it seemed like she had a private breeze which swirled around, cooling her. She was thin without the taut look of wiry people and her printed voile dresses and flowered hats were as right for her as denim overalls for a



Beyond the Page

NO AMERICAN POET HAS PLAYED A BIGGER ROLE IN TV AND MOVIES THAN ANGELOU

By Ted Scheinman



1959

ACTOR
PORGY & BESS

After dancing across Europe with a touring production of *Porgy & Bess*, Angelou appeared, uncredited, in the Otto Preminger film.

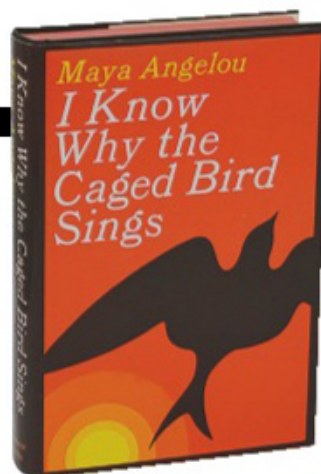


1972

SCREENWRITER
GEORGIA, GEORGIA

The film, about a love affair between a black American singer and a white American deserter she meets in Sweden, was one of the first movies in America scripted by a black woman.

▶ A first edition of the 1969 book. One copy from James Baldwin's personal library—inscribed “Joy! Maya Angelou”—is for sale online for \$12,000.



farmer. She was our side's answer to the richest white woman in town.

It is all there—life, not just in the American South but this American life, period—waiting for you to take the ride, the heartbreaking and brave journey that is Marguerite Johnson's young life. Ahead of its publication, James Baldwin said *Caged Bird* “liberates the reader into life simply because Maya Angelou confronts her own life with such a moving wonder, such a luminous dignity. I have no words for this achievement, but I know that not since the days of my childhood, when the people in books were more real than the people one saw every day, have I found myself so moved. . . . Her portrait is a biblical study in life in the midst of death.”

THE CRITICAL AND PUBLIC reaction to the book was immediate and powerful. It was nominated for a National Book Award in 1970 and remained on the *New York Times* best-seller list for two years. It sold more than one million copies, has been translated into 17 languages and has never been out of print.

Over the last five decades, Marguerite Johnson has come to live in our imagination in a hallowed literary land where you can imagine she jumps double dutch with Meg Murry from *A Wrinkle in Time* and Scout Finch from *To Kill a Mockingbird*.

Part of the reason the book continues to resonate is that it is, and always has been, more than a memoir

of one woman's life. It has emerged as a blueprint for our times—presaging and encompassing everything from the #MeToo movement to self-care to the question of how to stand at the end of a tumultuous decade and look forward with hope. The book reminds every reader about the power in meet-

ing brutal challenges head-on. As Angelou wrote in *Caged Bird*, her mother, Vivian Baxter Johnson, never flinched in the face of adversity: “She was Vivian Baxter Johnson. Hoping for the best, prepared for the worst and unsurprised by anything in between.”

It is the in-between of Angelou's life that is so engaging and surprising. She was the first black female cable-car conductor in San Francisco, a successful calypso singer, a star of the New York theater taking on groundbreaking roles in productions such as French playwright Jean Genet's *The Blacks*, a foreign service aide in Ghana, a magazine editor in Cairo and the first black woman to direct a major feature film in America. She was a friend and confidante of both the Rev. Dr. Martin Luther King Jr. and Malcolm X.

In the end, it seemed there was nothing that Maya Angelou couldn't do. *Caged Bird* endures because it is a stunning reminder of all the possibility that lies on the other side of silence and suffering. ♦

BYLINES Veronica Chambers is the award-winning author of *Mama's Girl* and a lifelong Angelou fan.

◀ Angelou often wrote in hotel rooms with a few essentials: a deck of cards, a crossword puzzle, a Bible, a dictionary, a thesaurus and a bottle of sherry.



1977
ACTOR
“ROOTS”
In this serialized adaptation of Alex Haley's best-selling novel, Angelou portrayed Nyo Boto, grandmother to Kunta Kinte; Angelou's role was a composite character drawn from several in the book.



1996
ACTOR
“SESAME STREET”
Angelou narrated and guest-starred in “Elmo Saves Christmas” and made several other appearances on the public TV show. “Sesame Street” mourned Angelou's death in 2014 by thanking her on Twitter for “all the hugs.”



1993
ACTOR
“THERE ARE NO CHILDREN HERE”
Based on the nonfiction book by Alex Kotlowitz, the film follows two brothers, Lafayette and Pharoah Rivers, as they grow up in the turbulent Chicago of the 1980s. Angelou plays their grandmother, and Oprah Winfrey, right, plays their mother.



1998
DIRECTOR:
“DOWN IN THE DELTA”
Angelou's directorial debut stars Alfre Woodard as a single mother struggling in Chicago who goes to stay with family in Mississippi, where she and her children find a more joyful way of life.



FLOWER POWER

In big, bold canvases, the Mexican muralists put their own stamp on 20th-century art



ATEN-YEAR revolution had united Mexico under a progressive constitution, but in the 1920s the country remained culturally fragmented. So the government commissioned monumental artworks that celebrated Mexico's culture and history and valorized its common people—especially the indigenous peasants whom artists saw as representing “the real Mexico,” says Barbara Haskell, curator of a new exhibition focused on Mexican muralists, opening at New York’s

Alfredo Ramos Martínez's 1929 *Calle Lily Vendor* is one of 200 works on view at the Whitney Museum by Mexican artists and the U.S. artists they influenced.

Whitney Museum of American Art in February. These muralists also inspired a generation of American artists, who admired their heroic depictions of popular struggle. “Most of us grew up thinking that the dominant influence in the U.S. in the 20th century came from France,” Haskell says. But “looking at those decades, 1925 to 1945, what becomes clear is the huge impact of the Mexican muralists, who created images that were accessible, that really meant something, and did it in a very modern way.” ♦



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Tracing The Enslaved

A massive new online database connecting billions of records offers vital details about slavery's toll

IN 1834, A 22-YEAR-OLD Yoruba man who would come to be known as Manuel Vidau was captured as a prisoner of war and sold to slave traders in Lagos, today the largest city in Nigeria. A Spanish ship transported him to Cuba, where he was sold to a white man who forced him to roll 400 cigars a day (if his pace slowed, he recalled, he would be “stripped, tied down and flogged with the cow hide”). A decade later, however, Vidau secured permission from a new owner to hire himself out, and with his earnings he bought a share in a lottery ticket—and won. That allowed him finally to buy his freedom. He married a fellow former slave, Maria Picard, and ➔

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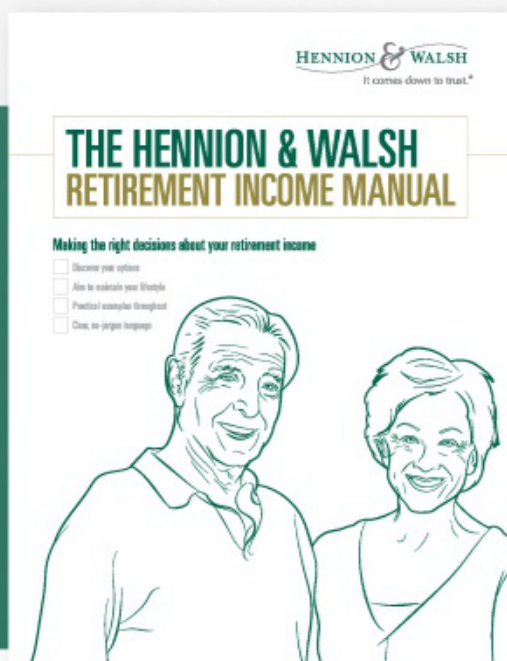
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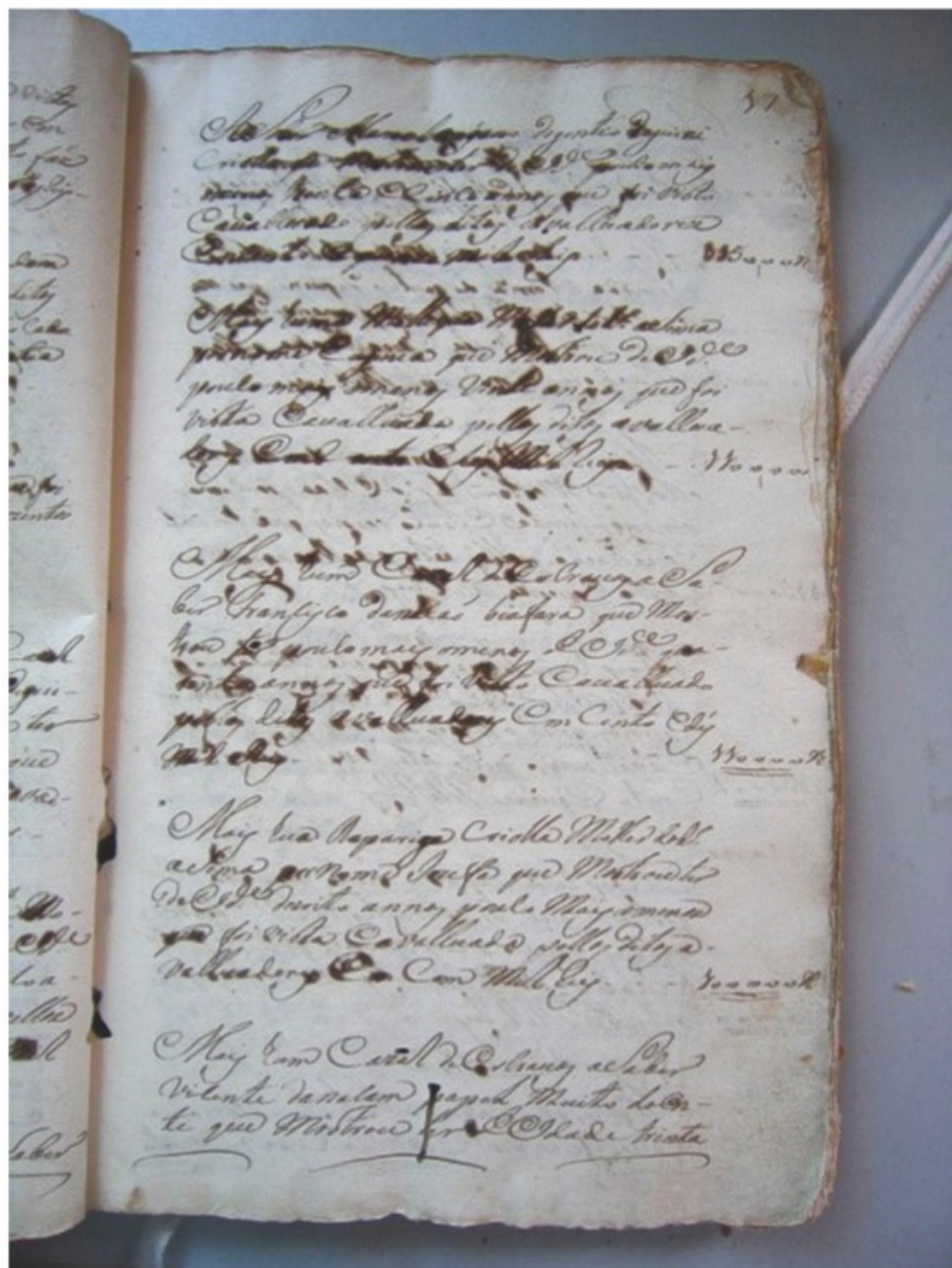
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▲ An 1864 document written by Cleto Congo, a man of African descent working in Rio de Janeiro, seeking emancipation. Congo signed the document in the lower right.

they adopted a young relative whose parents had died of cholera. Vidau supported his wife and son by continuing to roll cigars, eventually making enough money to cover their passage to England.

Vidau's stroke of fortune is known today only because he had a chance encounter with a representative of the British and Foreign Anti-Slavery Society. The organization recorded his story in its journal, which was later shelved in a university library, digitized and eventually collected in an online database called "Freedom Narratives." Enslaved people like Vidau—torn away from their communities of origin, deprived of the ability to write about themselves and treated as cargo or property in official documents—often left little of themselves to the historic record. Still, even a few facts can shape the outline of a life of sorrow, adversity, perseverance and triumph.

"One of the biggest challenges in slave studies is this idea that people were unknowable, that the slave trade destroyed individuality," says Daryle Williams, a historian at the University of Maryland. "But the

slave trade didn't erase people. We have all kinds of information that's knowable—property records, records related to births, deaths and marriages. There are billions of records. It just takes a lot of time to go look at them, and to trace the arc of an individual life."

Williams, a specialist in the African diaspora of Brazil, is one of the principal investigators of a massive new online database called "Enslaved: Peoples of the Historic Slave Trade," which will launch later this year. It aims to serve as a clearinghouse for information about enslaved people and their captors. Headquartered at Matrix, the Center for Digital Humanities & Social Sciences at Michigan State University, and funded by a founding \$1.5 million grant from the Mellon Foundation, Enslaved will serve as a hub for many smaller digitization projects, Freedom Narratives among them. For the first time, says Williams, anyone from academic historians to amateur genealogists will be able to trace individuals, families, ethnic groups and populations through dozens, hundreds or even thousands of archives, making connections that will enrich our understanding of slavery.

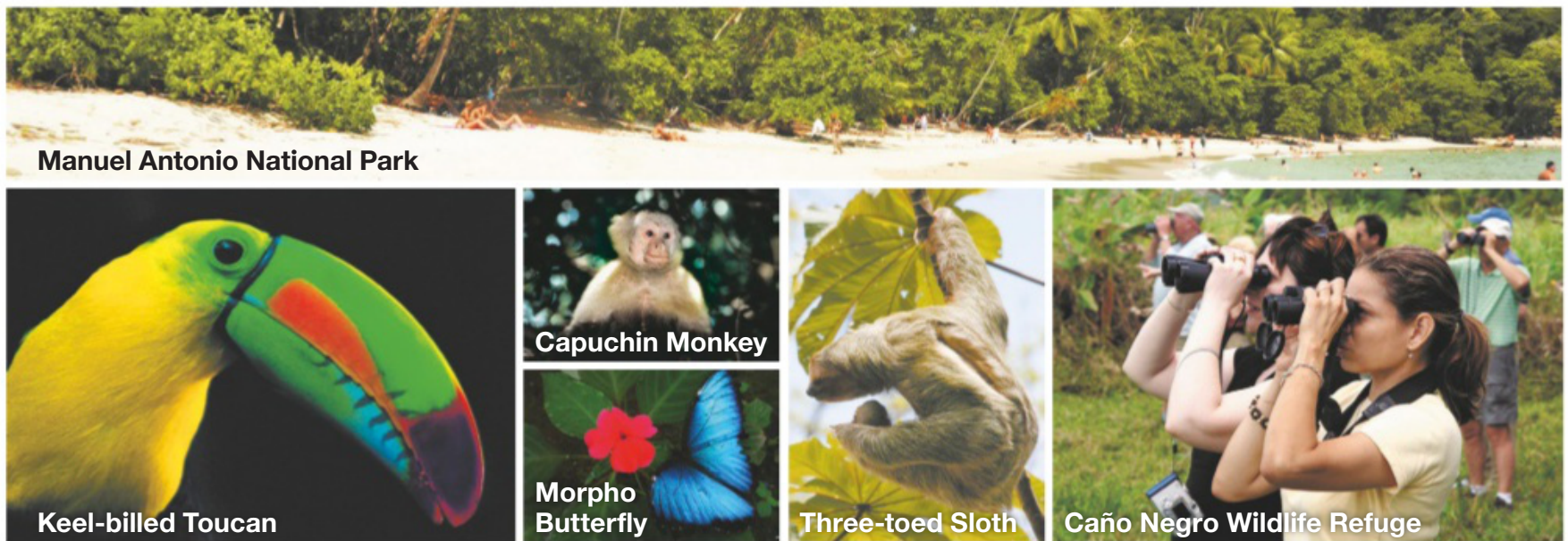
"This tool," Williams says, "will have the potential to show that even in the context of this horrible crime, there are still threads that hold people's lives together."

THE STUDY OF THE historic slave trade depends on numbers—the 12.5 million people kidnapped from Africa and shipped to the New World between 1525 and 1866, the 10.7 million who survived the two-month voyage, the 3.9 million enslaved in the United States just before the Civil War. These figures are horrifying, but at the same time their very enormity can have a numbing effect, which is why contemporary historians are increasingly turning to biography.

"Individual stories make a difference," says Leslie Harris, a historian at Northwestern University, who writes about and teaches the history of slavery. "We do need to know the vast numbers that we're talking about, that this was the largest forced migration in history, but when you begin to talk about these big

“
IT COULD HELP US GAIN A GREATER UNDERSTANDING OF HOW PEOPLE WEREN'T JUST SWEEPED UP BY HISTORY, HOW THEY SPOKE BACK.
”

DARYLE WILLIAMS



Manuel Antonio National Park

Keel-billed Toucan

Capuchin Monkey

Morpho Butterfly

Three-toed Sloth

Caño Negro Wildlife Refuge

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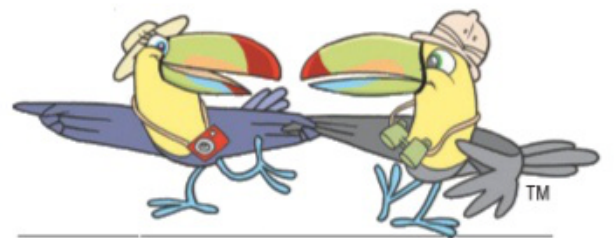
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- 3, 4 **Fortuna** Magic Mountain
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concepts in terms of individual lives, you can better understand what these things mean.”

The challenge, says Harris, who is not affiliated with the Enslaved project, has been to move beyond the well-told stories of once-enslaved activists like Harriet Tubman and Frederick Douglass. The “linked open data” at the core of the Enslaved archive offers broader possibilities. “This project is so important,” Harris says. “It could help us gain a greater understanding of how people weren’t just swept up in history, but how they spoke back to power, how they fought for their families.”

It’s always been easiest to assemble a vivid picture about people whose lives are well documented, whether in letters, newspapers or official records held in libraries and archives. For that reason, the doings of white people from the upper classes have long made up the core of what Americans and Europeans tend to think of as history.

“For too long, it has been difficult, painstaking and often impossible to write histories of all but a relatively few Americans of African descent, because documents have not been organized in a way that allows that,” explains Walter Hawthorne, a historian at Michigan State and one of the Enslaved project’s principal investigators. “Documentation often exists, but it has not been well preserved, well cataloged and made searchable.”

Historians, of course, have long made good use of various records, from plantation inventories and escaped slave advertisements to personal narratives



A detail from a page in a 1767 slave inventory from Maranhao, Brazil. It lists the household slaves belonging to a judge in the city, including their ages and birthplaces.

Unlike in the English colonies, where enslaved people were treated almost exclusively as property, in Spanish and Portuguese America, they “were considered fully human, with souls to be saved,” Landers says. Their life events were faithfully recorded, often by the Catholic church. The earliest of these archives date to the 16th century.

“We keep finding surprises,” Landers says. “We have found records for long-abandoned Franciscan missions in the middle of nowhere in Brazil, for cities that no longer exist in Cuba

or in Haiti. Wonderful scholars before me have used some of these ecclesiastics records and incorporated them into studies, but nobody had really studied them at length, or made a point of collecting them.”

By partnering with Enslaved, the Slave Societies Digital Archive can link their work with other collections. Emory University, for example, has digitized records of nearly 36,000 historic slaving voyages and details of 91,491 Africans liberated by naval courts, which will also be included in “Enslaved.” The Matrix team at Michigan State hosts an open access archive about enslaved people in Louisiana, which includes names, ethnicities and occupations of individuals listed in government records. And Harvard’s Hutchins Center for African and African American Research, led by Henry Louis Gates Jr., is contributing a selection of its collected biographies of people of African descent.

“What we want to do is take a portion of everyone’s data and put it in one big pot,” says Dean Rehberger, the director of Matrix and another of Enslaved’s principal investigators. “Then we can see if the same person appears in more than one, and we can build up these fragments and put them together.”

It turns out there’s a surprisingly simple way to turn life histories, ship manifests, census records and other information into machine-readable data: the semantic triple, which involves entering information in three-part sentences, each with a subject, a predicate and an object. “It’s something like, ‘Maria Picard was born in 1822,’ or ‘Maria Picard married Manuel Vidau,’” explains Rehberger. Such three-part units of information can be mined from any biography, list, article or directory, and then linked to

IT TURNS OUT THERE’S A SIMPLE WAY TO TURN LIFE STORIES INTO MACHINE-READABLE DATA.

collected by obscure abolition societies. But those details are housed at far-flung institutions, and not consistently organized. Jane Landers, a historian at Vanderbilt University, set out in 2003 to change that. Since that time, the project called the “Slave Societies Digital Archive” has digitized some 700,000 pages of religious and other documents from colonial Brazil, Colombia, Cuba, Florida and Angola.

LEARN ABOUT genealogy at the African American History Museum at [Smithsonianmag.com/lineage](https://smithsonianmag.com/lineage)

other information units in a vast network. Thanks to modern computing power, so-called “triplestores” now exist with hundreds of billions of entries on every topic imaginable.

The Michigan State team has spent two years building their own vast network of triples. But the project, they realize, may never be complete. The historic slave trade lasted nearly 350 years and touched millions of lives, and there remain undiscovered or little-known troves of information around the world. Even a family Bible could hold a valuable data point. So in addition to acting as a database for existing slavery information, Enslaved will also offer a publishing platform for data, with a peer-review process modeled after scholarly journals.

“Historians tend to just go out and collect what they want, whatever they need for their particular

thing,” Rehberger says. “But what if you actually went to a physical archive thinking in larger terms, that this is something that could be of value to others? We want people to see that publishing data is an important part of humanities research, just like it is in the sciences. And isn’t it interesting to think that digital humanities is going to be led, transformed even, by slave studies?”

AFTER MANUEL VIDAU and his wife, Maria Picard, set sail for England, they hoped to be able to return to Lagos and reunite with family they had last seen decades before. It isn’t known if they ever made it home. But perhaps, in some ship’s manifest or census record waiting to be digitized and connected, there lies a clue to the fate of this ordinary man who made a life for himself against all odds. ♦

Still Standing

A PRESERVATIONIST RACES TO SAVE THE POIGNANT DOMESTIC
LEGACY OF THE NATION’S SLAVEHOLDING PAST

By **Amy Crawford**



▲ Top, a slave house in Prince William County, Virginia, in 1959. Above, the restored house, 2013. It was caught in the crossfire at the Second Battle of Bull Run in 1862.

WHEN **JOBIE HILL** first stepped over the threshold of a slave house, her experience was visceral. “You notice the size, the amount of light, the ventilation,” she says, “and you can imagine what it would have been like for you, personally, to live there.”

Hill, an Iowa architect specializing in historic preservation, has spent the past seven years visiting former slave dwellings. At each location, she records GPS coordinates, makes photos and sketches a site plan. She adds these drawings to a digital database, called “Saving Slave Houses,” which currently includes 145 sites across the United States. When possible, she includes descriptions of the homes from the enslaved African-Americans who lived in them.

To locate the slave houses, Hill relies largely on a government survey from the 1930s that included about 500 of them. There’s an urgency to her work because most of these buildings remain in private hands and aren’t protected sites. Often, property owners don’t even know their sheds, cottages or outbuildings were slave quarters until Hill gets in touch.

While many slave houses are in disrepair, Hill says the fact that they’re still standing at all, more than 150 years after emancipation, is often a testament to the skill and ingenuity with which enslaved people built them. As Hill says, “These were not just helpless, hopeless people.” ♦



Karen Kaia Livers, left, and Jordan Rome took part in last November's dramatization of the historic rebellion. Organizers raised the provocative question: What would have happened if the revolt had succeeded?

"FREEDOM OR DEATH!"

Revisiting the 1811 Louisiana slave uprising

ON THE NIGHT OF JANUARY 8, 1811, beginning on the Andry Plantation in Louisiana, several hundred enslaved black people overthrew their masters and began the two-day trek eastward to New Orleans, where they planned to free the region's slaves and create a polity ruled by free blacks. It was the largest slave revolt in U.S. history—and quickly forgotten.

By
Ted Scheinman

Photographs by
Daniella Zalcman

Over two days last November, more than 300 black re-enactors wearing 19th-century clothes traced the rebels' 26-mile route from LaPlace, in St. John the Baptist Parish, through the industrial sweep of lower Louisiana—a stretch known as “cancer alley” because of high rates of the disease attributed to chemical pollutants—and into Congo Square in New Orleans.

The re-enactors, some on horseback, wielded axes, pitchforks, muskets and machetes. “We’re going to end slavery!” they cried. “Onto New Orleans! Freedom or death!”

The march was the creation of the performance artist Dread Scott. “This image of a slave army is not the popular image people have of slavery,” Scott says, even though “revolts of ten or



On the second day, re-enactors strode along a levee near the Shell Norco refinery. The flag reads “Death or Liberty!” Scott designed other flags for the march, drawing on Creole, Yoruba and other influences.



▲ Scott recruited re-enactors via word-of-mouth and by holding town halls at local universities, including Tulane and Xavier. The participants invited onlookers to join, and some did.

more people were actually pretty common.” He’s unsurprised that many Americans are unfamiliar with the rebellion. “There have been efforts to prevent people from knowing” about it, he says.

BYLINES

Paris-based photographer **Daniella Zalcman’s** work focuses on the legacy of Western colonization.

At the time, whites didn’t want enslaved people in other areas to be stirred by the rebellion on the German Coast, named for an influx of German settlers to Louisiana in the 18th century. As Daniel Rasmussen writes in *American Uprising: The Untold Story of America’s Largest Slave Revolt*, the government and slave owners “sought to write this massive uprising out of the history



books,” and were quite successful in doing so.

A Louisiana government militia crushed the original uprising on the morning of January 10. After trials on the plantations, most of the insurgents were executed, dismembered and displayed. The heads of many participants came to adorn pikes along River Road on the Mississippi.

To Scott, the sight of re-enactors in ante-

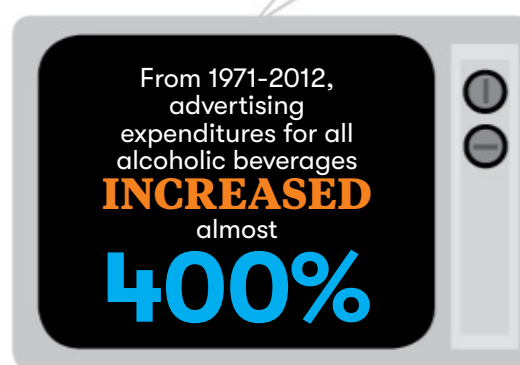
bellum garb marching through a modern industrial landscape is not as jarring as it might seem: He notes that many of the enslaved were buried where factories now stand. “You can’t understand America if you don’t understand slavery,” Scott says, “and you can’t understand slavery if you don’t know that slave revolts were constant.” ♦

▲
Clockwise from top left, Tolliver Anderson, Necho Webster, Derron Cook and Dread Scott. “I feel a lot of sympathy for the struggle because I’ve immersed myself in it” via re-enactment, Scott says.

HEY, BARTENDER

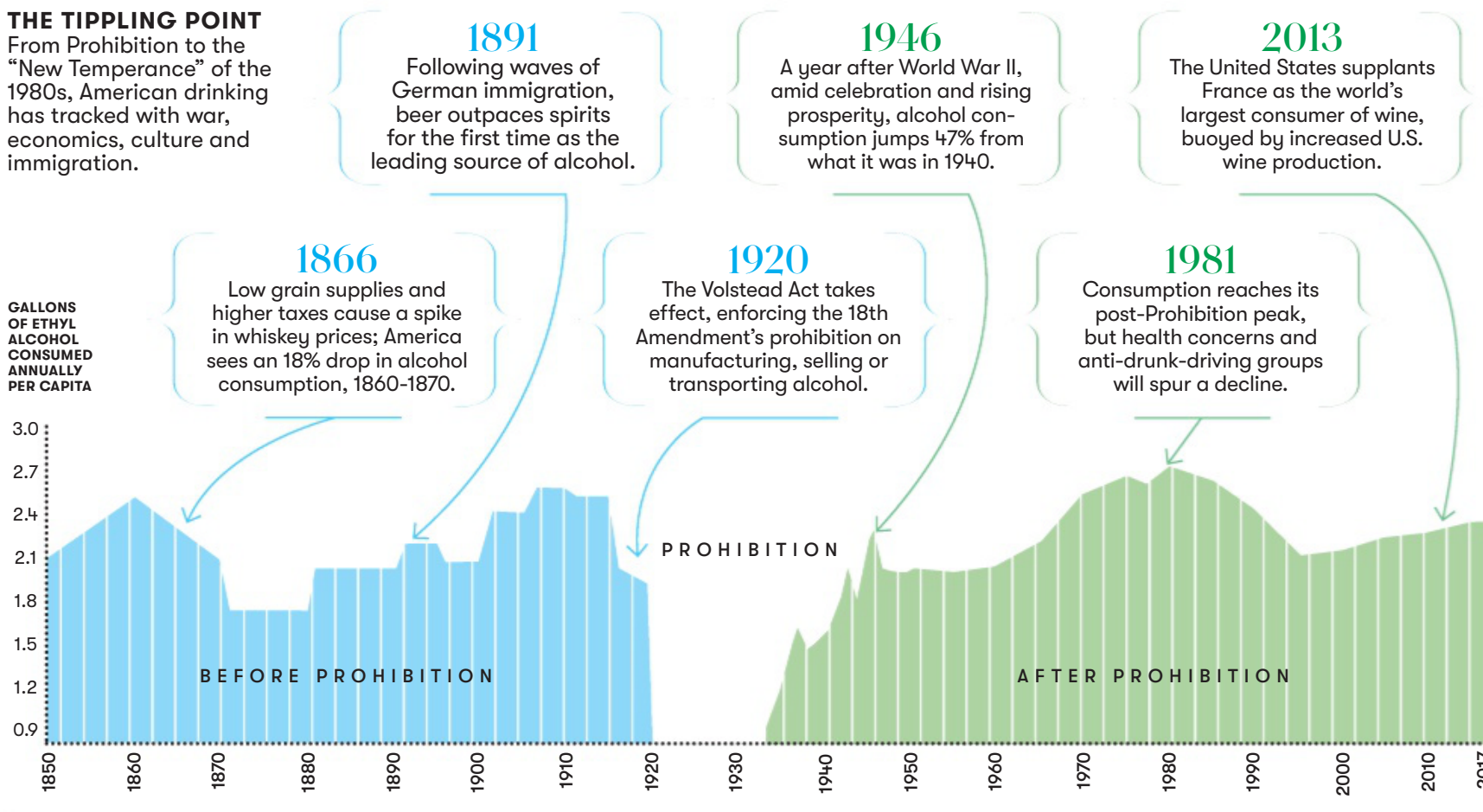
A century after Prohibition, we uncork a history of the nation's changing drinking habits

MARK TWAIN WROTE A COLUMN in July of 1867 bemoaning the “compulsory temperance” movement then gaining ground in Massachusetts: “Prohibition only drives drunkenness behind doors and into dark places, and does not cure it or even diminish it.” The federal government would test that proposition starting 100 years ago in January. Perhaps surprisingly, historians still debate whether the 18th Amendment really improved public health. Some note that drinking fell during the nearly 14 years of Prohibition; others say it just gave folks a thirst for hard liquor, which was readily bootlegged. In any case, alcohol consumption is higher today than it was in 1919. ♦



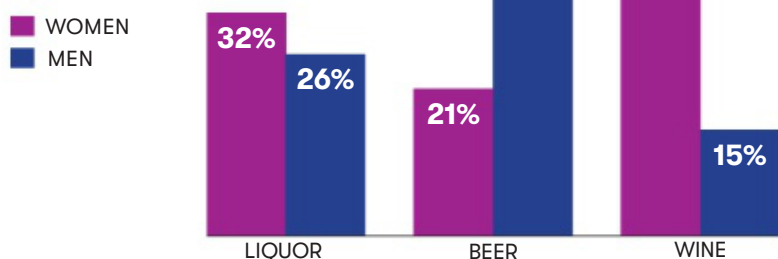
THE TIPLING POINT

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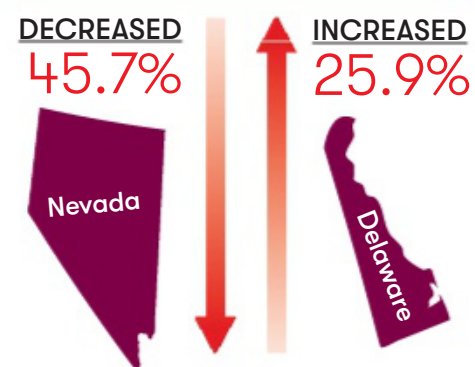
The percentage of men and women who say liquor, beer or wine is their preferred alcoholic beverage.



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IN SNOWY ALASKA, if you spend hours in the brilliant sun of spring or summer, you risk snow blindness, a sunburn on your cornea from reflected ultraviolet light.

For thousands of years, indigenous peoples throughout that region have had a technology solution: Snow goggles, fashioned from a strip of bone, wood or other material, with a slit cut into it, greatly reduced glare and protected eyes from injury. Ann McMullen, a curator at the Smithsonian National Museum of the American Indian, oversees research for its holdings, including the snow goggle collection; the pair shown here was made from whale baleen.

This style of eyewear can even improve vision, as Ann Fienup-Riordan discovered one day in 2010. An Anchorage-based anthropologist who works with the Yupik people to develop exhibits and books about their culture, she had recently undergone surgery on her retinas, and “the vision

FROM THE
SMITHSONIAN
NATIONAL
MUSEUM OF
THE AMERICAN
INDIAN

Inupiaq goggles carved from baleen, circa 1890. The Tunumiit (East Greenland Eskimo) woman's sealskin parka in the background was made around 1910.

in my right eye was still pretty fuzzy,” she says. But when she held the Yupik goggles up to her eyes? “I could see!”

What was going on? It turns out the slit focuses the light, much as a pinhole camera does. As a result, far-off objects appear sharper “and your vision was much, much better,” Fienup-Riordan says. Long before the invention of eyeglasses with glass or plastic lenses, Alaska’s indigenous inhabitants, including the Yupik people, devised their own corrective eyewear. Phillip Moses, a tribal member in Toksook Bay, calls them “Yupik prescription sunglasses.”

The gear is a testament to exceptional engineering talent. The Yupik people do not possess an indigenous word for “science,” but they have had a nuanced grasp of the physics, biology and chemistry that propel the natural world. They use every material they can get their hands on to craft tools and clothing that help them survive a frigid, treacherous environment.

To keep warm indoors, they devised an entrance to their wooden houses, or *qasgi*, that tunnels

By
Clive Thompson

Photograph by
Larry McNeil

Made in Alaska

The coolest shades in the Arctic, fashioned to protect against snow glare, were an early example of indigenous ingenuity

“
**ONE CAN SEE THEIR
INTELLIGENCE THROUGH
THEIR THINGS.**
”

downward in a U shape. Since warm air rises, it cannot escape through the submerged exit. To keep dry they created a waterproof lining out of fish skins, a kind of rustic Gore-Tex. While out hunting and fishing, the Yupik people always carry a *negcik*, a wooden walking stick with a bone hook affixed to the end. It becomes a claw with myriad uses: grabbing items out of kayaks, protecting yourself from bears, or pulling yourself out of freezing water if you're unlucky enough to fall in.

"Our ancestors were so ingenious in making hunting tools," a Yupik elder named Willie Kamkoff once told Fienup-Riordan. Paul John, a Yupik elder who lives in Toksook Bay, says, "One can see their intelligence through their things."

It's tough stuff, too. At the American Indian museum is a Yupik child's parka, made from soft bird skin lined with feathers—a gorgeous piece of craft. One day Frank Andrew, a tribal elder, examined it with Smithsonian curators and Fienup-Riordan. He described how traditionally you'd care for it. "Take it outside and beat it with a stick," he said.

In a world increasingly concerned with environmental resilience, Yupik technology is a beacon of sustainability. No scrap goes to waste. Yupik women twine grass into comfy socks and fashion it into fibers so strong they can be used as components in dog harnesses.

Some Yupik elders worry that reliance on modern Western goods and urban life is dimming reliance on creative traditions. But Fienup-Riordan believes that enough people are still hunting and fishing to preserve essential techniques. A new issue is emerging, though, one that is disrupting generations-old seasonal patterns.

"The ocean isn't freezing up the way it did in the past," she says. "Freeze-up is later in the fall. And break-up is much earlier in the spring. It's really extraordinary." After thousands of years of inventively surviving a subzero world, the Yupik people have a new engineering challenge: adapting to a warmer one. ♦

TO SEE MORE examples of snow goggles from the American Indian museum, go to Smithsonianmag.com/goggles



Generational Warfare

The Veneration Gap

OLDER PEOPLE HAVE GROUSED ABOUT YOUNGER PEOPLE FOR MILLENNIA. NOW WE KNOW WHY

By Ted Scheinman

COMPLAINING ABOUT the young is a longstanding prerogative of the old; just as baby boomers and Gen X'ers today lament the shortcomings of millennials and Gen Z, parents in the 1920s looked askance at their flapper daughters, the mothers of pre-revolutionary France poooh-pooohed their "effeminate" sons, and so on back to the fourth century B.C. and Aristotle, who said of Greece's young people: "They think they know everything, and are always quite sure about it."

Now, some 2,500 years later, researchers are offering a pair of psychological explanations for this recurring complaint, or what they call the "kids these days effect." In studies involving 3,458 Americans ages 33 to 51 recruited and evaluated online, John Protzko and Jonathan Schooler of the University of California, Santa Barbara, measured respondents' authoritarian tendencies, intelligence and enthusiasm for reading. "While people may believe in a general decline," the researchers observed in the journal *Science Advances*, "they also believe that children are especially deficient on the traits in which they happen to excel."

Authoritarian people, it turns out, are more likely to suspect that today's youth are lacking in respect for authority, while well-read people are more likely to bemoan that kids these days never seem to be reading. More intelligent people are also more likely to say that young people are getting stupider—a remarkable conviction, given decades of rising intelligence domestically and globally.

At the heart of this denigrating effect is flawed memory, Protzko and Schooler say. Sometimes older people mistakenly recall that kids in the past were more accomplished than today's kids, who suffer by comparison. "People in their 20s and 30s are going to grow up looking at kids and thinking they're deficient," Protzko says. So, while the baby boomers continue to weather volleys of "OK, boomer" from youngsters who blame them for despoiling the earth, older Americans can take comfort in knowing that members of Generation Z will one day hear the inevitable: "OK, zoomer." ♦

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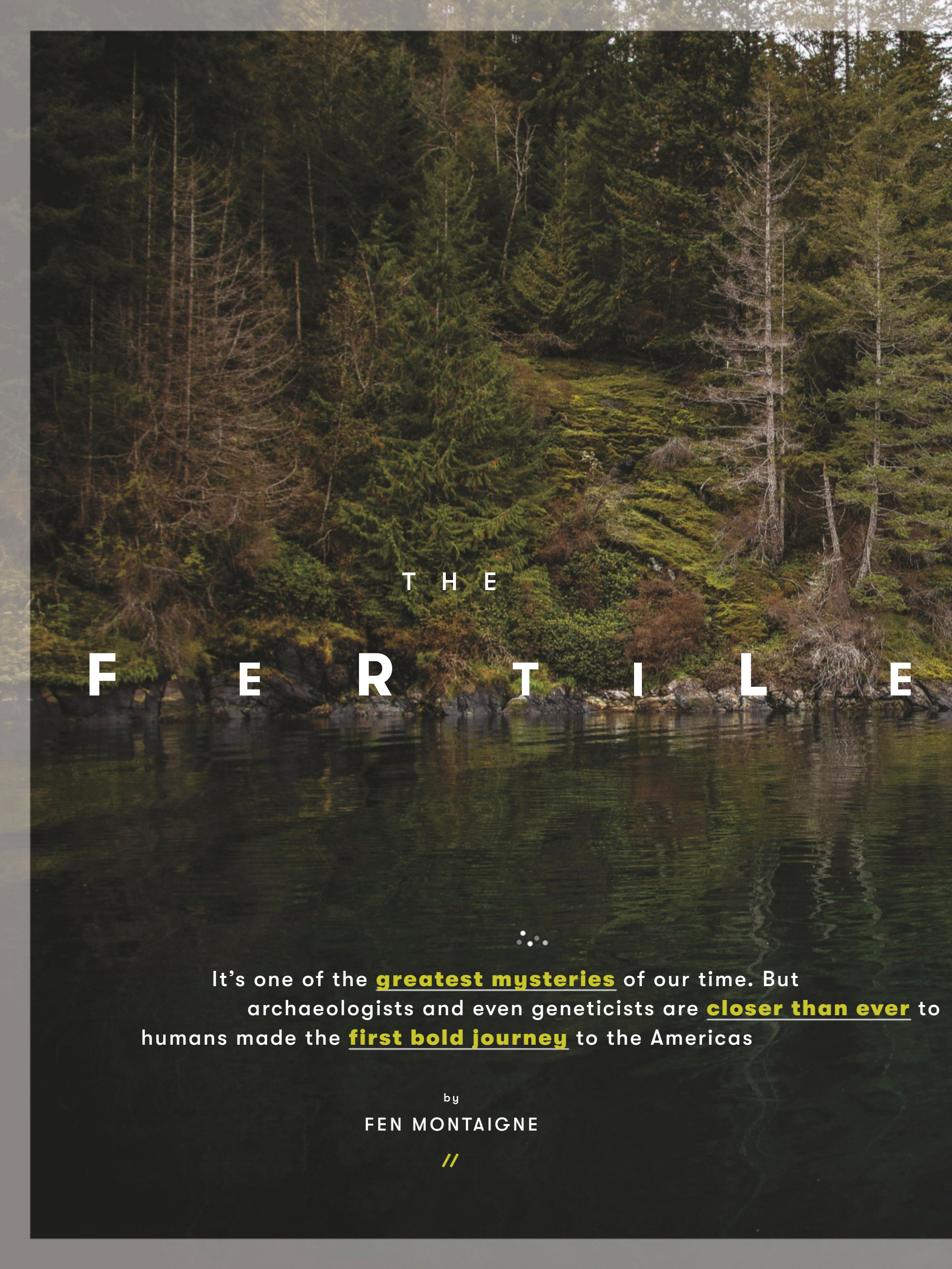
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THE FERTILE

It's one of the greatest mysteries of our time. But
archaeologists and even geneticists are closer than ever to
humans made the first bold journey to the Americas

by
FEN MONTAIGNE

//

Photographs by
Rafal Gerszak

S H O R E

understanding when

The coastline of Quadra Island in British Columbia. Some scientists believe that prehistoric humans spent thousands of years in the region.



FOR MORE THAN HALF A CENTURY, THE PREVAILING STORY of how the first humans came to the Americas went like this: Some 13,000 years ago, small bands of Stone Age hunters walked across a land bridge between eastern Siberia and western Alaska, eventually making their way down an ice-free inland corridor into the heart of North America. Chasing steppe bison, woolly mammoths and other large mammals, these ancestors of today's Native Americans established a thriving culture that eventually spread across two continents to the tip of South America.



In recent years, however, that version of events has taken a beating, not least because of the discovery of archaeological sites in North and South America showing that humans had been on the continent 1,000 or even 2,000 years before the supposed first migration. A subsequent theory, known as the “Kelp Highway,” came closer to the mark: As the massive ice sheets covering western North America retreated, the first humans arrived on the continent

▲ Paleolithic evidence: a modified carnivore tooth from the Yana River in Siberia; a spear point from Quadra Island; a stone flake found on the island, at Yeatman Bay.

not only by foot but by boat, traveling down the Pacific shore and subsisting on abundant coastal resources. Supporting that idea are archaeological sites along the West Coast of North America that date back 14,000 to 15,000 years.

Now our understanding of when people reached the Americas—and where they came from—is expanding dramatically. The emerging picture suggests that humans may have arrived in North Amer-



Louie Wilson
 (in hat), an
 archaeologist
 and member of
 the We Wai Kai
 nation, works
 with graduate
 students from
 the University of
 Victoria to record
 data on Quadra
 Island, British
 Columbia.

vanished world is called Beringia, and the developing theory about its pivotal role in the populating of North America is known as the Beringian Standstill hypothesis—“standstill” because generations of people migrating from the East might have settled there before moving on to North America.

Much of this new theorizing is driven not by archaeologists wielding shovels but by evolutionary geneticists taking DNA samples from some of the oldest human remains in the Americas, and from even older ones in Asia. Those discoveries have opened a wide gap between what the genetics seem to be saying and what the archaeology actually shows. Humans may have been on both sides of the Bering Land Bridge some 20,000 years ago. But skeptical archaeologists say they will not believe in this grand idea until they hold the relevant artifacts in their hands, pointing out that

ica at least 20,000 years ago—some 5,000 years earlier than has been commonly believed. And new research raises the possibility of an intermediate settlement of hundreds or thousands of people who spread out over the wild lands stretching between North America and Asia.

The heart of that territory has long since been submerged by the Pacific Ocean, forming the present-day Bering Strait. But some 25,000 to 15,000 years ago, the strait itself and a continent-size expanse flanking it were high and dry. That

no confirmed North American archaeological sites older than 15,000 to 16,000 years currently exist. But other archaeologists are confident it is only a matter of time until older sites are discovered in the sprawling, sparsely populated lands of eastern Siberia, Alaska and northwestern Canada.

It’s an exciting, if at times esoteric, debate, touching on basic questions we’re all connected to, such as why people first came to the Americas and how they managed to survive. Yet no matter when or how they made the trek, the coast of what

PAVEL IVANOV; RAFAL GERSZAK; AL MACKIE (2)

is now Canada was on their itinerary. And that's what brought me to British Columbia to meet up with a group of anthropologists who have discovered important signs of ancient life along the Pacific.



THE RUGGED SHORELINE of British Columbia is carved by countless coves and inlets and dotted with tens of thousands of islands. On a cool August morning, I arrived on Quadra Island, about 100 miles northwest of Vancouver, to join a group of researchers from the University of Victoria and the nonprofit Hakai Institute. Led by anthropologist Daryl Fedje, the team also included his colleagues Duncan McLaren and Quentin Mackie, as well as Christine Roberts, a representative of the Wei Wai Kum First Nation.

The site was located on a tranquil cove whose shores were thick with hemlock and cedar. When I arrived, the team was just finishing several days of digging, the latest in a series of excavations along the British Columbia coast that had unearthed artifacts from as far back as 14,000 years ago—among the oldest in North America.

On a cobble beach and in a nearby forest pit that was about six feet deep and four feet square, Fedje and his colleagues had discovered more than 1,200 artifacts, mostly stone flakes, a few as old as 12,800 years. All testified to a rich maritime-adapted culture: rock scrapers, spear points, simple flake knives, gravers and goose egg-size stones used as hammers. Fedje reckoned that the cove site was most likely a base camp that was ideally situated to exploit the fish, waterfowl, shellfish and marine mammals from the frigid sea.

For Mackie, the archaeological riches of the British Columbian coast reveal a key flaw in the original Bering Land Bridge theory: its bias toward an inland, rather than a marine, route. "People say the coast is a wild, nasty environment," said Mackie, a stoutly built man with an unruly gray beard and battered green hat, as he took a break from using a screen to sift through rock and earth from the Quadra dig site. "But you have lots of food resources. These were the same people as us, with the same brains. And we know that in Japan people routinely moved back and forth from the mainland to the outer islands by boat as long ago as 30,000 to 35,000 years."

Several recent studies show that as the last ice age began to loosen its grip, portions of the coastline of British Columbia and Southeastern Alaska were becoming ice-free as far back as 17,000 to 18,000 years ago. Fedje and others note that humans walking

Humans could have **traveled by boat** down these shorelines after the ice retreated. "People were likely in Beringia early on....There is the potential to go back **as early as 18,000 years.**"



across the Bering Land Bridge from Asia could have traveled by boat down these shorelines after the ice retreated. "People were likely in Beringia early on," says Fedje. "We don't know exactly, but there certainly is the potential to go back as early as 18,000 years."

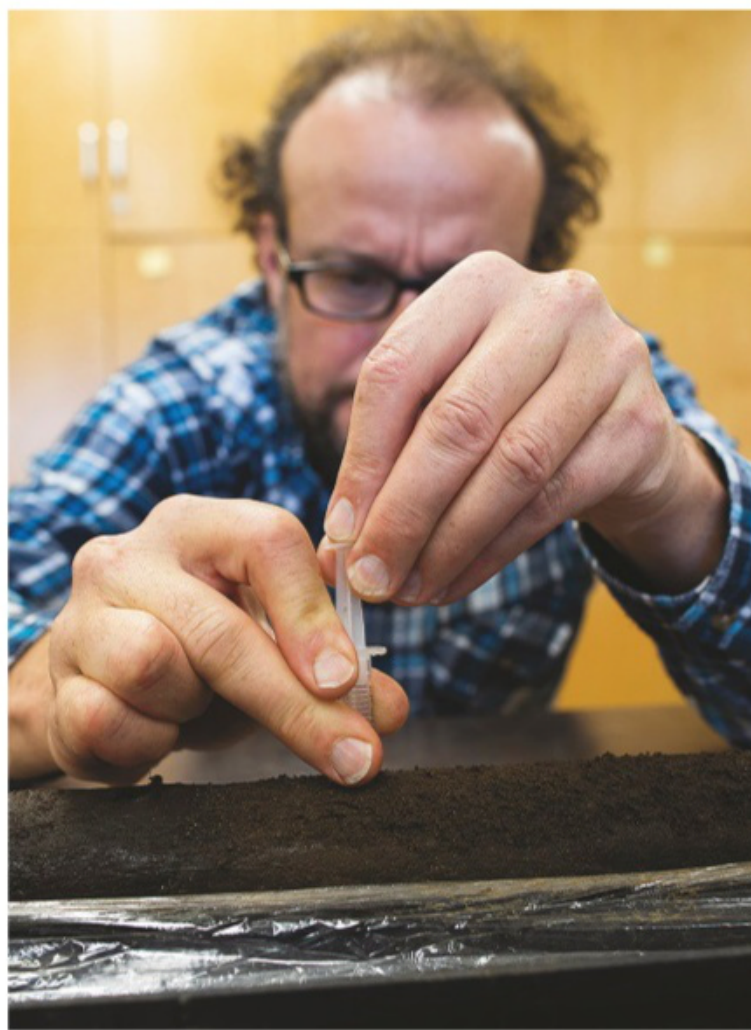
Fedje, McLaren and Mackie stressed that one of the main goals of their decades-long investigations has been to document the ancient culture of British Columbia's indigenous coastal communities. But in the opinion of many of their North American peers, the trio's cutting-edge techniques for finding coastal sites have also put the men in the vanguard of the search for the first Americans.



TODAY, THE COAST of the Pacific Northwest bears little resemblance to the world the first Americans would have encountered. The lushly forested shore-



Top, digging on Quadra Island, about 150 feet above today's sea level. Above, a shell imprint found in a ledge shows that marine life once thrived at this level.



QUADRA ISLAND FINDS

Top, artifacts shelved by type at the University of Victoria. A biface is a stone implement flaked on both sides; a multidirectional core is a tool used to make weapons. Above left, a spear point presumably launched by an atlatl. Above right, archaeologist Duncan McLaren takes a sample of Quadra Island sediment. Studying this sediment helped researchers learn that the shoreline wasn't stable for a long time after the last ice age.

line I saw would have been bare rock following the retreat of the ice sheets. And in the last 15,000 to 20,000 years, sea levels have risen some 400 feet. But Fedje and his colleagues have developed elaborate techniques to find ancient shorelines that were not drowned by rising seas.

Their success has hinged on solving a geological puzzle dating back to the end of the last ice age. As the world warmed, the vast ice sheets that covered much of North America—to a depth of two miles in some places—began to melt. This thawing, coupled with the melting of glaciers and ice sheets worldwide, sent global sea levels surging upwards.

But the ice sheets weighed billions of tons, and as they vanished, an immense weight was lifted from the earth's crust, allowing it to bounce back like a foam pad. In some places, Fedje says, the coast of British Columbia rebounded more than 600 feet in a few thousand years. The changes were happening so rapidly that they would have been noticeable on an almost year-to-year basis.

"At first it's hard to get your head around this," says Fedje, a tall, slender man with a neatly trimmed gray beard. "The land looks like it's been there since time immemorial. But this is a very dynamic landscape."

That dynamism proved to be a blessing to Fedje and his colleagues: Seas did indeed rise dramatically after the end of the last ice age, but along many stretches of the British Columbia coast, that rise was offset by the earth's crust springing back in equal measure. Along the Hakai Passage on the central coast of British Columbia, sea-level rise and the rebound of the land almost perfectly canceled each other out, meaning today's shoreline is within a few yards of the shoreline 14,000 years ago.

In order to track ancient shorelines, Fedje and his colleagues took hundreds of samples of sediment cores from freshwater lakes, wetlands and intertidal zones. Microscopic plant and animal remains showed them which areas had been under the ocean, on dry land and in between. They commissioned flyovers with laser-based lidar imaging, which essentially strips the trees off the landscape and reveals the features—such as the terraces of old creek beds—that might have been attractive to ancient hunter-gatherers.

These techniques enabled the archaeologists to locate, with surprising accuracy, sites such as the one on Quadra Island. Arriving at a cove there, Fedje recalled, they found numerous Stone Age artifacts on the cobble beach. "Like Hansel and Gretel, we followed the artifacts and found them eroding out of the creek bed," Fedje said. "It's not rocket science if you

have enough different levels of information. We're able to get that needle into a tiny little haystack."

In 2016 and 2017, a Hakai Institute team led by archaeologist Duncan McLaren excavated a site on Triquet Island containing obsidian cutting tools, fishhooks, a wooden implement to start friction fires and charcoal dating from 13,600 to 14,100 years ago. On nearby Calvert Island, they found 29 footprints belonging to two adults and one child, stamped into a layer of clay-rich soil buried under the sand in an intertidal zone. Wood found in the footprints dated back roughly 13,000 years.

Other scientists are conducting similar searches. Loren Davis, an archaeologist at Oregon State University, has



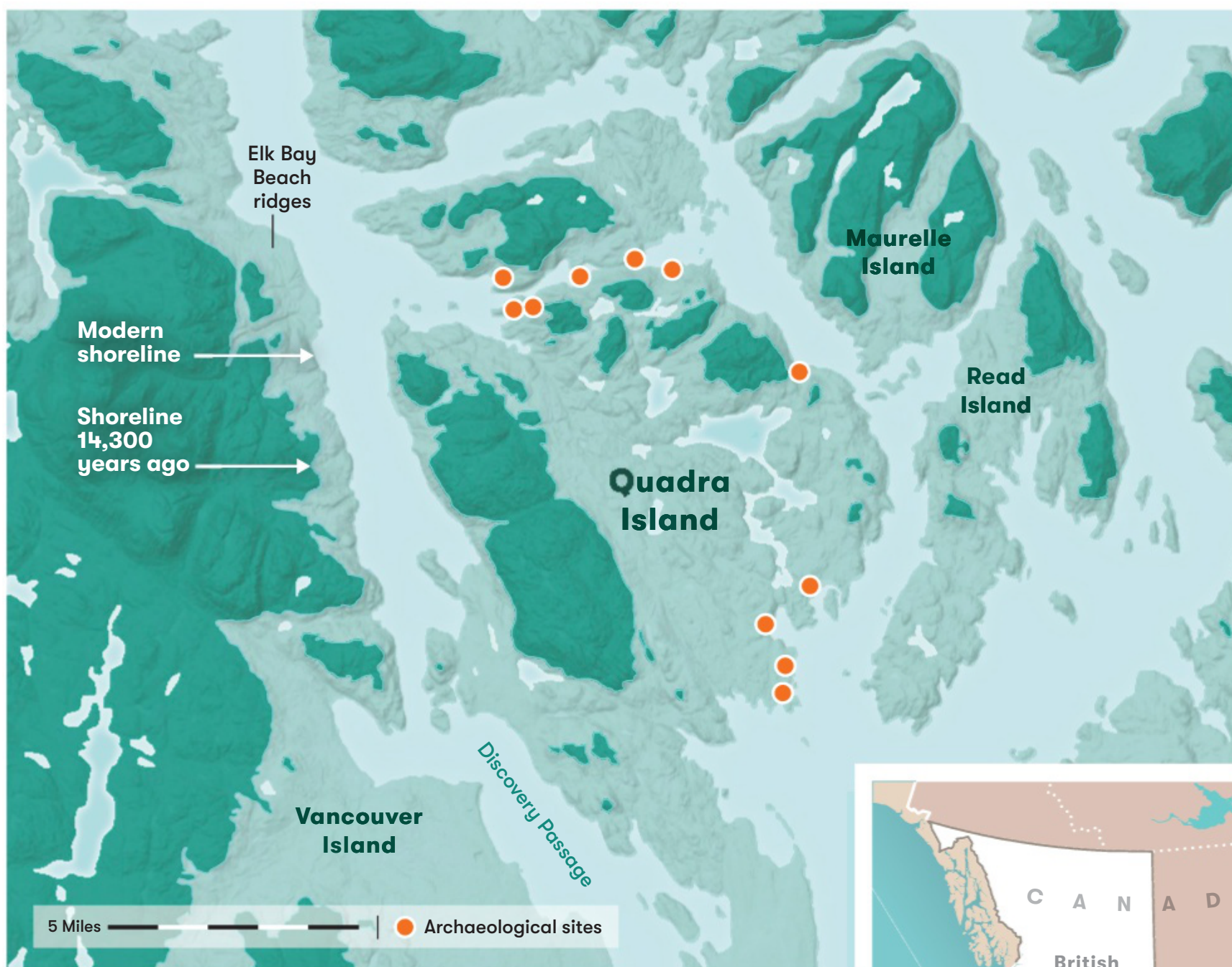
cruised from San Diego to Oregon using imaging and sediment cores to identify possible settlement sites drowned by rising seas, such as ancient estuaries. Davis' work inland led to his discovery of a settlement dating back more than 15,000 years at Cooper's Ferry, Idaho. That find, announced in August 2019, meshes nicely with the theory of an early coastal migration into North America. Located on the Salmon River, which connects to the Pacific via the Snake and Columbia rivers, the Cooper's Ferry site is hundreds of miles from the coast. The settlement is at least 500 years older than the site that had long been viewed as the oldest confirmed archaeological site in the Americas—Swan Point, Alaska.

"Early peoples moving south along the

Archaeologists Daryl Fedje and Quentin Mackie look at darts from Quadra Island. Today, the island is home to about 600 members of the indigenous We Wai Kai Nation.

After the Last Ice Age, a “Rebound”

// WATER FROM MELTING GLACIERS RAISED SEA LEVELS. BUT EARTH’S CRUST, UNBURDENED, ROSE EVEN HIGHER



Pacific Coast would have encountered the Columbia River as the first place below the glaciers where they could easily walk and paddle into North America,” Davis said in announcing his findings. “Essentially, the Columbia River corridor was the first offramp of a Pacific Coast migration route.”



AN AXIOM IN ARCHAEOLOGY is that the earliest discovered site is almost certainly not the first place of human habitation, just the oldest one archaeologists have found so far. And if the work of a host of evolutionary geneticists is correct, humans may already have been on the North American side of the Bering

Land Bridge about 20,000 years ago.

Eske Willerslev, who directs the Center for GeoGenetics at the Globe Institute at the University of Copenhagen and holds the Prince Philip chair of ecology and evolution at the University of Cambridge, sequenced the first ancient human genome in 2010. He has since sequenced numerous genomes in an effort to piece together a picture of the first Americans, including a 12,400-year-old boy from Montana, 11,500-year-old infants at Alaska’s Upward Sun River site and the skeletal DNA of a boy whose 24,000-year-old remains were found at the village of Malta, near Russia’s Lake Baikal.

According to Willerslev, sophisticated genomic analyses of ancient human remains—which can determine when populations merged, split or were

▲ Dig sites near the coastline on Quadra Island, where sea levels 14,300 years ago were about 650 feet above modern-day levels. By 12,000 years ago, they were within ten feet of today’s.

BYLINES

Fen Montaigne, an author and veteran journalist, covers science and the environment.
Polish-born **Rafal Gerszak** photographs life in remote communities of northern Canada.



Yeatman Bay, near one of the excavation sites on Quadra Island.



isolated—show that the forebears of Native Americans became isolated from other Asian groups around 23,000 years ago. After that period of genetic separation, “the most parsimonious explanation,” he says, is that the first Americans migrated into Alaska well before 15,000 years ago, and possibly more than 20,000 years ago. Willerslev has concluded that “there was a long period of gene flow” between the Upward Sun River people and other Beringians from 23,000 to 20,000 years ago.

“There was basically an exchange between the populations across eastern and western Beringia,” Willerslev said in a phone interview from Copenhagen. “So you had these groups hanging around Beringia and they are to some degree isolated—but not completely isolated—from each other. You had those groups up there, on both sides of the Bering Land Bridge, around 20,000 years ago. I think that is very likely.”

This new evidence, coupled with paleoecological studies of Beringia’s ice age environment, gave rise to the Beringian Standstill hypothesis. To some geneticists and archaeologists, the area in and around the Bering Land Bridge is the most plausible place where ancestors of the first Americans could have been genetically isolated and become a distinct people. They believe such isolation would have been virtually impossible in southern Siberia, or near the Pacific shores of the Russian Far East and around Hokkaido in Japan—places already occupied by Asian groups.

“The whole-genome analysis—especially of ancient DNA from Siberia and Alaska—really changed things,” says John F. Hoffecker of the University of Colorado’s Institute of Arctic and Alpine Research. “Where do you put these people where they cannot be exchanging genes with the rest of the Northeast Asian population?”

Could humans have even survived at the high latitudes of Beringia during the last ice age, before moving into North America? This possibility has been buttressed by studies showing that large portions of Beringia were not covered by ice sheets and would have been habitable as Northeast Asia came out of the last ice age. Scott Elias, a paleoecologist with the University of Colorado’s Institute of Arctic and Alpine Research, used a humble proxy—beetle fossils—to piece together a picture of the climate in Beringia 15,000 to 20,000 years ago. Digging in peat bogs, coastal bluffs, permafrost and riverbanks, Elias unearthed skeletal fragments of upwards of 100 different types of tiny beetles from that period.

Comparing the ancient beetle fossils with those found on similar landscapes today, Elias concluded that southern Beringia was a fairly moist tundra environment that could have supported a wide variety of animals. He says that winter temperatures in the southern maritime zone of Beringia during the peak of the last ice age were only slightly colder than today, and summer temperatures were likely 5 to 9 degrees Fahrenheit cooler.

“People could have made a pretty decent living along the southern coast of the land bridge, especially if they had knowledge of marine resource acquisition,” says Elias. “The interior in Siberia and Alaska would have been very cold and dry, but



“In a few hundred years they are taking off across the entire continent and spreading into different habitats. It’s driven by something other than just resources. And I think the most obvious thing is curiosity.”



there were large mammals living there, so these people may have made hunting forays into the adjacent highlands.”

Proponents of the Beringian Standstill hypothesis also point to a cluster of remarkable archaeological sites on Siberia’s Yana River, located on the western edge of Beringia, 1,200 miles from what is now the Bering Strait. Situated well above the Arctic Circle, the Yana sites were discovered in 2001 by Vladimir Pitulko, an archaeologist with the Institute for the History of Material Culture in St. Petersburg. Over nearly two decades, Pitulko and his team uncovered evidence of a thriving settlement dating back 32,000 years, including tools, weapons, intricate beadwork, pendants, mammoth ivory bowls and carved human likenesses.

Based on butchered animal skeletons and other evidence, Yana appears to have been occupied year-round by up to 500 people from 32,000 to 27,000 years ago and sporadically inhabited until 17,000 years ago. Pitulko and others say Yana is proof that humans could have survived at high latitudes in Beringia during the last ice age.



Excavations along the Yana River in Siberia in 2007, where cultural artifacts and human remains were found beneath 23 feet of frozen sediment.



YANA RIVER RELICS

Objects from the Yana site give clues into the civilization that once thrived there 32,000 years ago. These prehistoric people may have crossed paths with the ancestors of today's American Indians. Clockwise from far left: a pendant made from a horse tooth, an amber pendant, an anthraxolite quartz pendant made to resemble a mammoth's head, a decorated fragment carved from ivory, and part of a large, ornamented ivory vessel.



Some researchers say Beringia wasn't just a bridge between continents but a vast territory where thousands of humans lived, fished and hunted for generations.



Yet the ones who made it across the Bering Land Bridge were apparently not the people of Yana. Willerslev's lab extracted genetic information from the baby teeth of two boys who lived at the site 31,600 years ago and found that they shared only 20 percent of their DNA with the founding Native American population. Willerslev believes Yana's inhabitants were likely replaced by, and interbred with, the paleo-Siberians who did eventually migrate into North America.

Once in the New World, the first Americans, probably numbering in the hundreds or low thousands, traveled south of the ice sheets and split into two groups—a northern and southern branch. The northern branch populated what are now Alaska and Canada, while members of the southern branch “exploded,” in Willerslev's words, down through North America, Central America and South America with remarkable speed. Such a

CONTINUED ON PAGE 110

by FRANZ LIDZ

NATURE'S

•••••

Strains of *Streptomyces* bacteria, found in soil, grow in a lab at Swansea University in Wales. They're so new to science they haven't been named.



.....

PHARMACY

Photograph by JASON PIETRA

.....

AN ANCIENT LEGEND LEADS TO A
GRAVEYARD IN NORTHERN IRELAND
WHERE SCIENTISTS ARE ZEROING IN
ON A **POWERFUL NEW ANTIBIOTIC**

.....



It's a splendid day for a turn around a graveyard: dark, damp, forbidding. A thin mist billows like a mourner's veil between the iron gates of Sacred Heart Roman Catholic Church, and moisture drips from the yews like tears. In this Northern Irish churchyard, burial plots line the paths like little marble farms for the dead.

I meander past the Boho High Cross of County Fermanagh, a tenth-century monument whose carvings feature scenes from Genesis and the Baptism of Christ. I skirt graves marked McAfee, McCaffrey, McConnell, McDonald, McGee . . . At last, atop a bosky knoll, I reach the weatherworn headstone of James McGirr, a parish priest who died in 1815, age 70.

Out here in the Boho Highlands, part of the West Fermanagh Scarplands, five miles from the border with the Republic of Ireland, there's a longstanding belief among parishioners that the earth Father McGirr was buried under had almost miraculous curative powers. "The good father is said to have been a faith healer," says Gerry Quinn, a microbiologist who grew up in the area. "On his deathbed he supposedly declared: 'After I die, the clay that covers me will cure anything that I was able to cure when I was with you while I was alive.'" This led to a curious local custom: Petitioners will kneel beside the plot, remove a thumbnail-size patch of dirt and put it into a cotton pouch. "They will then bring the packets home—taking pains not to speak to anyone they encountered on the road—and place the pouches under their pillows," Quinn says. "The soil is believed to alleviate many minor ailments, like flesh wounds and sore throats."

On this particular afternoon, the grave is carpeted with spoons—teaspoons, tablespoons, soup spoons, even a grapefruit spoon. "To dig with," Quinn more or less explains. The wooden post beside the priest's headstone instructs visitors what prayers to offer up to him and how to sample the "blessed clay": ONLY A SPOONFUL OF SOIL SHOULD BE REMOVED AND MUST BE RETURNED TO FR MCGIRR'S GRAVE ON THE FOURTH DAY. "According to legend," says Quinn, "failure to take back the soil within four days brings very bad luck."

For those of us who don't subscribe to fable, this antic County Fermanagh folk remedy may strike a skeptical chord. But legend often reveals truth that reality obscures. Quinn, who has since moved on to Northern Ireland's Ulster University, and his former colleagues at Swansea University Medical School in Wales recently discovered that the hallowed Boho (pronounced Bo) dirt possesses unique antibiotic properties—and may provide a new weapon in the long-running arms race against antibiotic-resistant bacteria.

According to the Swansea researchers, the soil over Father McGirr contains a previously unknown strain of *Streptomyces*, a genus of the phylum

> In Northern Ireland, at the 204-year-old grave of Father McGirr, signs explain how to borrow a bit of healing soil—and return it on time. Or else.

"THE GOOD FATHER IS SAID TO HAVE BEEN A FAITH HEALER. ON HIS DEATHBED HE SUPPOSEDLY DECLARED: 'THE CLAY THAT COVERS ME WILL CURE ANYTHING I WAS ABLE TO.'"





THIS
Sacred

IN THE MEMORY
OF
MR. REV. JOHN SMYTH
Pastor of the Church
of this Parish
who departed this life
on the 11th day of
April 1865
aged 50 years
of which he was
a member for 20 years
his remains were
interred in the
grave of his mother
ANNE SMYTH

THE PRAYERS ARE TO BE SAID WHEN USING THE
SACRED CLAY

1. YOUR FATHER
2. YOUR MOTHER
3. YOURSELF
4. YOUR BROTHERS
5. YOUR SISTERS
6. YOUR NEAR AND DEAR RELATIVES
7. YOUR FRIENDS
8. YOUR COUNTRY
9. YOUR KING
10. YOUR GOD

THE PRAYERS ARE TO BE SAID ON
THE GRAVE AND RETURNING THE
CLAY TO THE GRAVE AND 3 TIMES DAILY WHILE
YOU LIVE IT
DAILY A SPOONFUL OF SOIL SHOULD BE
REMOVED AND MUST BE FOLLOWED BY
ANOTHER SPOONFUL ON THE SECOND DAY
PLEASE DO NOT put any flowers, shells,
jewels, money, or other objects on the grave

Actinobacteria, which has produced about two-thirds of all currently prescribed antibiotics. Soil bacteria secrete chemicals to inhibit or kill competing bacteria, and this particular strain of *Streptomyces* happens to mess with several disease-causing pathogens that have become impervious to conventional antibiotics. Among the most notorious of these increasingly common superbugs is *Staphylococcus aureus*, better known as MRSA (methicillin-resistant *Staphylococcus aureus*), which is responsible for about a third of “flesh-eating bacteria” infections in the United States. It was Alexander Fleming’s serendipitous discovery of penicillin in 1928—mold accidentally contaminated a petri dish in his lab at St. Mary’s Hospital in London and some of the *Staphylococcus* bacteria he’d been growing in the dish were destroyed—allowed effective treatment of many infections that had routinely killed people. But superbugs annul the success of contemporary therapies by constantly mutating into tougher, more virulent strains. Like teenagers tapping out text messages, they’re adept at transmitting immunity genes to other pathogens.

Having evolved defenses to withstand the onslaught of modern antibiotics, superbugs are considered among the gravest and most intractable of global menaces. According to a new report from the United Nations, antibiotic-resistant infections claim at least 700,000 lives every year—including 230,000 deaths from drug-resistant tuberculosis alone. By 2050, the U.N. says, that toll seems likely to rise dramatically, with up to ten million people dying annually if “immediate, coordinated and ambitious action” does not occur. In this case, “action” means reducing the misuse of antibiotics—either deploying them for no good reason against illnesses like the flu or discontinuing an antibiotic before it was fully effective. Both practices contribute to the development of antibiotic-resistant bacteria.

It has been decades since drug researchers or medical scientists have discovered a new class of antibiotics: Most of the antimicrobial drugs in use today are just modifications of drugs that have been around more than half a century. In the search for new germ killers, researchers in the small but promising field of ethnopharmacology are investigating ancient herbal remedies and healing techniques and folk medicines. Which is what sent Quinn back to the graveyard at Sacred Heart.

LOCAL KNOWLEDGE of Boho’s unique terra firma may date to the mystical Druids, who occupied the land around 1,500 years ago, and perhaps stretches as far back as the Neolithic Age 3,500 years before that. “The legend of the magical soil is something



that’s resonated down through the ages,” says Des-sie McKenzie, owner and barkeep of the Linnet Inn, Boho’s only pub. (And of equal convenience to the local citizenry, he’s also the undertaker.) “Every town and village in Ireland seems to have a cure that involves taking something from someone and giving it back. Ours mirrors the mysterious side of Irish mythology, all these hidden secrets.”

Quinn heard the tale of McGirr’s soil from a great-uncle who also insisted that he could cure jaundice by foraging natural ingredients in the mountains. “You can look at this as an old wives’ tale and decide it’s all just superstition,” Quinn says. “Or you can check into it thoroughly to see if there’s anything in the soil that produces antibiotics. I prefer to check.”

> Gerry Quinn, at Ulster University’s Coleraine campus, compares cultivating *Streptomyces* to “growing orchids—it takes a bit of time and patience.”

SIMON WATSON (2)

BYLINES

Frequent contributor **Franz Lidz** reported recently for *Smithsonian* on new excavations at Pompeii. **Jason Pietra** specializes in still-lives. **Simon Watson** is a portrait and travel photographer.

“I WAS LOOKING FOR STUFF THAT COULD CURE INCURABLE INFECTIONS AND COULD TREAT INCURABLE CONDITIONS.”

....

Quinn steps out of the shadow of *The Big Fish*—a statue of a salmon dominating Belfast’s Donegall Quay—and into the bright sun like an explorer about to cross the Sahara on foot. He’s a sharp, ten-penny nail of a man whose intensity is leavened by a broad smile. He can be genial enough when circumstances demand, but if he’s telling you the latest dirt, you need to pay attention, and what you thought was a

◀ Spoons that visitors use to gather samples are left at the priest’s grave. Scientists have found microbes in the soil that have novel antibiotic properties.

casual conversation might quickly take on the aspect of a thesis defense.

“In the days before antibiotics, healing was a spiritual event,” he says. “Healthy people in the countryside got ill without any possibility of recovery. Any cure is miraculous, which is why it’s no coincidence that religion is interwoven with the healing arts.”

He cites a priest who has dismissed the cure as paganism. “It is perhaps a bit of paradox that clergy could be on the side of the rationalists and the scientists on the side of the unknown,” he says. “People are actually seeking out the cure not because of Father McGirr’s prophecy, but because there has been some scientific investigation.”

Quinn launched his research at Swansea University where he was a postdoctoral student. “I was looking for stuff that could cure incurable infections and treat incurable conditions,” he recalls. Paul Dyson, a molecular microbiologist, heads the Applied Molecular Microbiology research team at Swansea, and he had been conducting studies that isolated *Streptomyces* microbes directly from arid habitats, including Tibetan plateaus and a Saudi Arabian date farm. “In most of the environments we’ve gone to we’ve found new species,” he says. “Each environmental niche has its own community of different microorganisms that have evolved to live there. The reason *Streptomyces* produce antibiotics is that, unlike most bacteria, they’re nonmotile. They can’t swim away from incoming danger. Or swim toward anything that is attractive. They just sit there. They’re sedentary organisms. And to defend their microenvironment, they produce antibiotics to kill any competing organisms in the immediate vicinity.”

Dyson had just returned from Northwest China, hoping to pluck new *Streptomyces* species from the area’s extreme soils. Quinn took on the challenge of getting the finicky microbe to survive life in the lab. “So I tried to mimic the conditions of the desert. I was like, OK, hot in the daytime, cold at night.” By day, he stored the bacterium in a 113-degree incubator; by night, a room at 39 degrees. In time, the *Streptomyces* thrived.

That experience set him thinking about Boho’s dirty little secret. He knew that *Streptomyces* can often be found in inhospitable settings, like alkaline lakes, or caves. He also knew that the Boho region was one of the few alkaline grasslands in Northern Ireland. “I thought, ‘It has special plants, special limestone plants, special mountain plants.’” He wondered if the area had specialized organisms as



WHILE VISITING AN AUNT, QUINN ASKED, COULD HE TEST SOME OF HER CLAY? "THERE'S STUFF IN A GRAVE," SHE SAID, MEANING THE MCGIRR SITE. "I THOUGHT, 'WHY NOT? I'LL TAKE SOME BACK TO SWANSEA AND SEE.'"



well. When he went home on holiday, he took a couple of samples from the surrounding hills.

Then, while visiting an aunt, he asked, could he test some of her clay?

"There's stuff in a grave," she said, cryptically, meaning the McGirr site.

"Grave? Nah. That's one step too far: It's a bit spooky."

He soon reconsidered. "I thought, 'Why not? I'll take some with me to Swansea and see.'"

Back in the lab, a special protocol was used to isolate what turned out to be eight strains of *Streptomyces* from the Boho soil. Luciana Terra, a team member from Brazil, then went on to the next step, pitting the *Streptomyces* against some common pathogens. Eventually, the genomes were sequenced by growing each individual bacterium on a separate agar plate, extracting the DNA, reading the DNA fragments in a sequencer and comparing the sequence with known *Streptomyces* strains.

The new strains were then cage-matched with superbugs. To the research team's surprise, the strain inhibited both gram-positive bacilli and gram-negative, which differ in cell-wall structure; the gram-negative are generally more resistant to antibiotics because of the relative thickness of their cell walls.

But what to call the new bacterium? Owing to its sweet, woody, wintergreen oil-like aroma, Quinn suggested the not-particularly-lyrical *Streptomyces* Alkaline Fragrance. A friend suggested myrophorea, a Greek-derived name for the myrrh-bearing women in the New Testament who found the tomb of Jesus empty after the Resurrection. "The Myrrhbearers were known as 'The Carriers of the Fragrance,'" Quinn explains. "What could be more fitting?"

After Terra had processed the samples, Quinn, on his next trip to Boho, dumped what remained of the soil back onto Father McGirr's grave. "Sure, I'm a scientist," he says, deadpan, "but why take unnecessary risks?"

THE CURRENT MODEL FOR antibiotic development is in shambles. Due to meager profits and regulatory hurdles, legacy drug companies have largely abandoned research in the field, complain scientists confronting this issue. To bring a new drug to market typically requires an enormous outlay of time (10 to 15 years) and money (perhaps even upward of \$2 billion). Unlike medications for chronic conditions

Sacred Heart Church occupies a site perhaps inhabited as far back as the Bronze Age. Whether the ancients believed in the healing soil is lost to history.

like cancer or diabetes, most antibiotics are used for relatively short periods and are often curative. That might not matter if prices were high, but they're kept low throughout the developed and developing worlds, which tamps down incentive for pharmaceutical firms to come up with new agents. Last year alone, three Big Pharma outfits shut down their antibiotic programs. The few that are left—Merck, Pfizer and GlaxoSmithKline—often wind up vying to create compounds for the same infections. Given that bacteria can quickly develop resistance to a new antibiotic, public health experts recommend prescribing as little as possible. "Any new antibiotics must be managed very, very carefully if you want them to be useful, not just now, but in 10 or 20 years time," Dyson says. "There's not an appealing business plan for pharmaceutical companies—obviously they want to sell as much as they can within the patented lifetime of that antibiotic. So, in this context, good old capitalism doesn't necessarily help mankind or our health."

Which is why he and Quinn, hoping to keep their research going into the future, will pursue funding from nonprofits that don't face pressure to constantly generate earnings. Not that they're opposed to getting underwritten by one of the Big Fish. After all, Dyson notes, there is precedent for this. "Some major pharmaceutical companies waived their royalties in order to produce and distribute ivermectin for the treatment of river blindness and lymphatic filariasis."

For Julian Davies, financial backing has proved as elusive as the slipperiest of microbes. Davies, a British microbiologist, mentored Dyson at the Pasteur Institute in Paris, and leads a Canadian team that uncovered potent antimicrobial activity in a glacial clay deposit found off Kisameet Bay in British Columbia. The fine, pale-green clay has been used for many generations by the Heiltsuk First Nations people to treat burns, diabetes, arthritis and psoriasis.

In 2011 the Heiltsuk signed an operating agreement to allow a non-Heiltsuk company to harvest the clay, now branded as Kisolite, for commercial use. Davies was asked by the firm, Kisameet Glacial Clay, to study the clay's antimicrobial properties. To Davies, it sounded like quackery. It wasn't. In lab experiments, Davies and his team developed an experimental extract powerful enough to wipe out all 16 strains of bacteria tested, including superbugs.





In the sparsely populated Boho Highlands, niche habitats, including alkaline soils derived from limestone, support rare microbes awaiting discovery.





At his Swansea lab, Paul Dyson holds a culture of *Streptomyces myrophorea*. He laments the “dearth of funding for natural-product antibiotics.”



• • • • •

WHAT TO CALL THE NEW BACTERIUM? OWING TO ITS WINTERGREEN-LIKE AROMA, A FRIEND SUGGESTED MYROPHOREA, FOR THE MYRRH-BEARING WOMEN OF THE NEW TESTAMENT. "WHAT COULD BE MORE FITTING?"

• • • • •

Davies says the clay has also demonstrated the ability to combat mycobacterium ulcerans, a debilitating skin infection. But the company has stopped bankrolling Davies' research and seems to have decided to harvest the clay mainly as an ingredient for cosmetics. (Kisameet Glacial Clay did not respond to inquiries.)

As for the work begun at Swansea, after Terra, Dyson, Quinn and colleagues announced the discovery of their "novel *Streptomyces*" in the journal *Frontiers in Microbiology* last year, the task of identifying the precise, pathogen-busting compounds produced by the newly identified bacterium lies ahead. "We have narrowed down to one or two candidates," Quinn says. But funding remains an obstacle for this crucial next phase. "The research is still operating on a shoestring," Quinn acknowledges. "I also work half the time at other jobs to keep afloat." Having spent much of the summer and fall writing grant proposals, he now says that "there may be a company in America starting to take an interest."

Meanwhile, Quinn continues to roam the hillsides, whenever he happens to be home, on the hunt for breakthrough antimicrobials. "I have isolated a new species from soil higher up the mountain in Boho, maybe a mile from our churchyard site," he says. "The new species is inhibitory to gram-positive and gram-negative bacteria, and to yeasts as well, which is quite unusual. We will be doing lots of tests on this species and trying to sequence it."

DESSIE MCKENZIE, A HOSPITABLE IRISHMAN, pours a wee dram of a tawny, single-malt whiskey for a visitor from America. The bar at the Linnet Inn is empty, the door is locked; dust hangs in the air reflecting the afternoon sunlight and echoes of silence rattle in the corners.

News of the discovery of the McGirr soil's antibacterial potency prompted a dramatic rise in pilgrims to Sacred Heart Church, he says. A woman, so the story goes, arrived at the churchyard with a pillowcase draped over her shoulder. "She intended to fill it up and scatter the soil over the grave of a dead relative," McKenzie says.

I add: "I've been told that someone showed up looking for enchanted soil to heal a sick dog."

He replies, sighing heavily: "Sadly, not true. I heard it was a sick cow."

One out-of-towner had asked McKenzie if she needed to swallow the soil to "get the full medicinal benefits."

"I had to say, 'No, no. We definitely don't eat it!'"

"Oh, but I hear the cure works miracles," the visitor insisted.

With an even heavier sigh, McKenzie recalls, he counseled: "Ah, right then. Here's what you're supposed to do . . ."

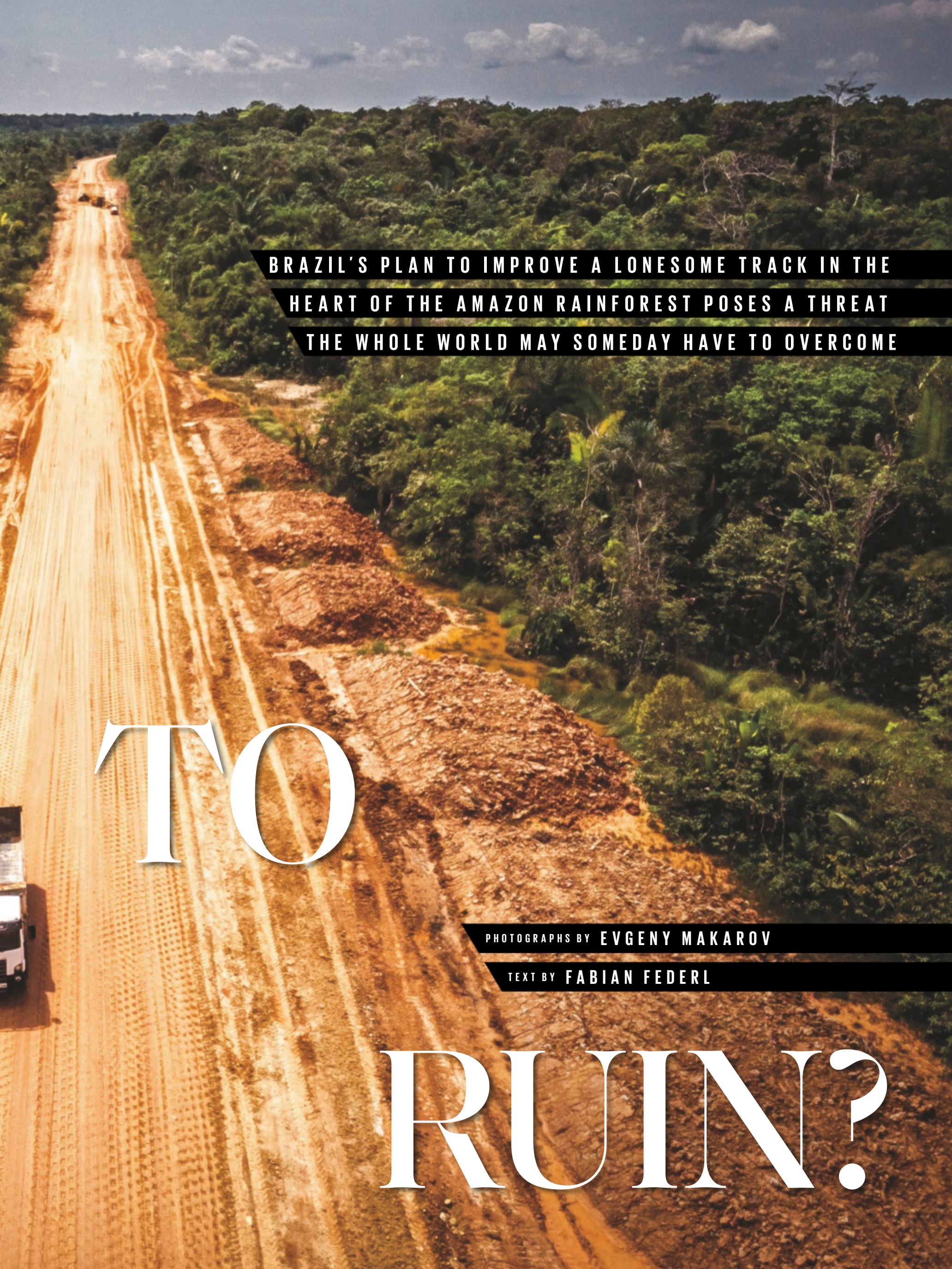
If there's one thing he's learned, it's never to treat soil like dirt. ♦

JASON PIETRA

THE ROAD

Ecologists fear that repaving the highway known as BR-319 will open new sections of the Amazon to catastrophic deforestation.



An aerial photograph showing a wide, reddish-brown dirt road that has been cleared through a dense, lush green Amazon rainforest. The road stretches from the bottom left towards the top center of the frame. On the left side of the road, there are deep, parallel tire tracks. To the right of the road, the forest is thick with various types of trees and vegetation. In the distance, a few small vehicles are visible on the road. The sky is blue with some white clouds.

BRAZIL'S PLAN TO IMPROVE A LONESOME TRACK IN THE
HEART OF THE AMAZON RAINFOREST POSES A THREAT
THE WHOLE WORLD MAY SOMEDAY HAVE TO OVERCOME

TO

PHOTOGRAPHS BY EVGENY MAKAROV

TEXT BY FABIAN FEDERL

RUIN?



We loaded the car onto the ferry in Manaus, Brazil, a city of two million people rising from the jungle where the Rio Negro flows into the Amazon River, a confluence as seemingly wide and wild as the ocean. The boat took us across the great bay, past stilted huts, floating docks and flooded forest. After more than an hour, we reached the terminus, on the south bank of the Amazon. We disembarked at a town of low-slung

cinder-block markets and houses with corrugated roofs. It was here that we began our real journey, a drive of several hundred miles down a rutted, frequently washed out, largely unpaved highway known as BR-319. The road plays a surprising role in the health of the Amazon rainforest, which, in turn, affects the composition of Earth's atmosphere and therefore the air we breathe and the climate

▲ Sawmills and lumberyards have sprouted along BR-319 near the frontier town of Realidade, where thousands work in illegal logging trades.

our descendants will experience, wherever on the planet they happen to live.

BR-319 was first built in the 1970s by Brazil's military dictatorship, which viewed the rainforest as *terra nullius*—a no-man's land waiting to be developed. Not long before, the government had established a free-trade zone in Manaus, and Harley-Davidson, Kawasaki and Honda soon built factories there. BR-319



Lumber is sometimes moved at night to evade authorities. Enforcement has largely stopped under pro-development President Bolsonaro.



Maria and João José Cordeiro, who run a guesthouse, think paving BR-319 would increase their business. But they worry industry will wipe out too much wilderness.



< A tire repair shop for heavy machinery in Realidade. The settlement of migrant workers boasts 21 churches as well as bars and a brothel.

in the Amazon rainforest remove as many as two billion tons of atmospheric carbon each year—acting as an important brake on global warming, and helping to replenish the atmosphere with oxygen.

Fearnside warns of a “tipping point,” a threshold of deforestation that, if crossed, will doom the ecosystem. Today, 15 to 17 percent of the rainforest has been wiped out. Once 20 to 25 percent is gone, experts say, more and more rainforest will turn into savanna, and that change will bring longer dry seasons, hotter temperatures, more fires and less rain. “The Amazon will go from CO₂-storing to CO₂-emitting,” Fearnside says, with dire global consequences.

So far, most of the deforestation in Brazil—up to 95 percent—has taken place within 3.5 miles of a road. Which is why environmental advocates and others were alarmed this past July when Brazilian President Jair Bolsonaro announced plans to rebuild BR-319 in order to spur economic development. Between August 2018 and July 2019,

“What protects the forest best is its being inaccessible.”

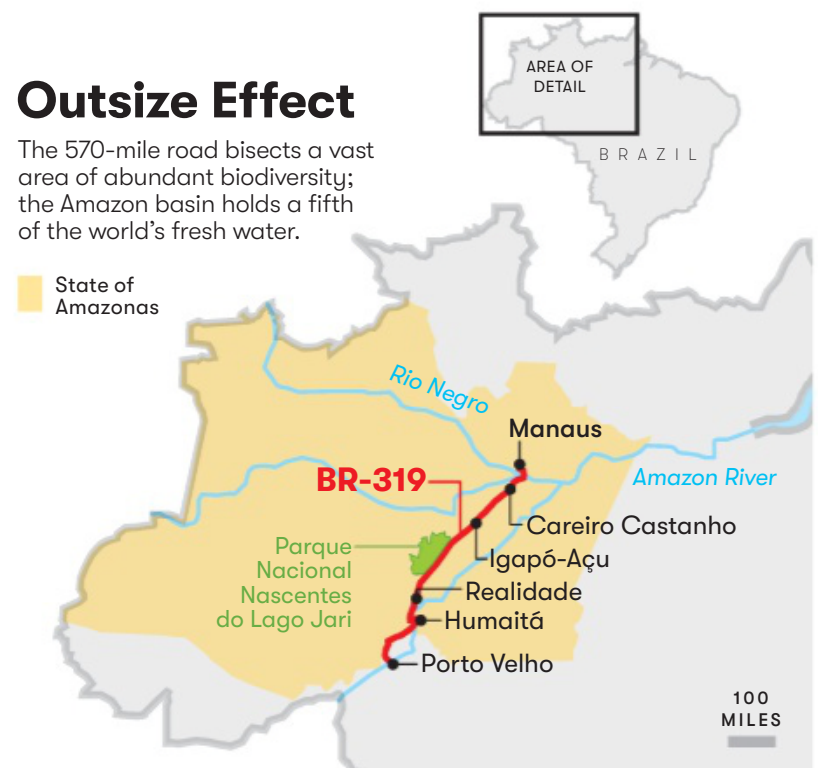
connected Manaus to Porto Velho, 570 miles to the southwest, and thus to São Paulo and beyond. But when the military regime abdicated, in the 1980s, Brazil’s young democratic government lost interest in BR-319, and after years of neglect much of the route had become virtually impassable.

That was fortunate, according to many scientists and conservationists: It limited industrial logging and forest-clearing in the region. As roads go, BR-319 is especially significant because it traverses a vast unspoiled region, says Philip Fearnside, an American ecologist based at Manaus’ National Institute of Amazonian Research, or INPA. “It runs into the heart of the Amazon,” he says. “What protects the forest best is its being inaccessible.”

Ecologists are concerned because trees and other vegetation

Outsize Effect

The 570-mile road bisects a vast area of abundant biodiversity; the Amazon basin holds a fifth of the world’s fresh water.



BYLINES

This is Rio de Janeiro-based photojournalist **Evgeny Makarov**’s first appearance in *Smithsonian*.
Writer **Fabian Federl** contributes to German-language magazines *Die Zeit*, *Brand Eins*, *Das Magazin* and more.



An aerial photograph showing a town situated along a wide river. In the foreground, a multi-lane highway bridge crosses the river. The town below is densely packed with buildings, mostly with light-colored roofs. A road runs through the town, parallel to the river. The background shows a large, dark green forested area with some water bodies. The sky is a pale, hazy blue.

Signs claim “private property” along the road,
even though we are in a national park.

BR-319 crosses
the Castanho
Mirim River at
the town of
Careiro Castan-
ho, where the
paved northern
section of the
highway ends.

nearly 3,800 square miles of the Brazilian Amazon were destroyed, a 30 percent increase over the previous year—signifying a dramatic upward trend after years of declining rates, which ecologists attribute to environmental deregulation under Bolsonaro.

In July, I came to the Brazilian state of Amazonas to drive the long-abandoned road. For 90 miles south of the port town of Careiro da Várzea, BR-319 is paved, but soon it becomes a dirt track. With a guide, João Araújo de Souza, an indigenous Amazonian who grew up 25 miles south of Manaus, we set off through the forest. De Souza, who works as a technician at INPA, has driven BR-319 many times. We crossed bridges of rough-hewn planks and rivers of black water, stained dark like tea by decaying vegetation. Such black water, de Souza explains, is a good sign—no malaria, because the larvae of disease-bearing mosquitoes can't survive in such highly acidic water.

In a town called Careiro Castanho, 90 miles from Manaus, we pass the last gas station for hundreds of miles. Another few hours and we reach a reserve known as Igapó-Açu—a “green barrier” spanning almost a million acres of forest, enveloping BR-319. This “sustainable development

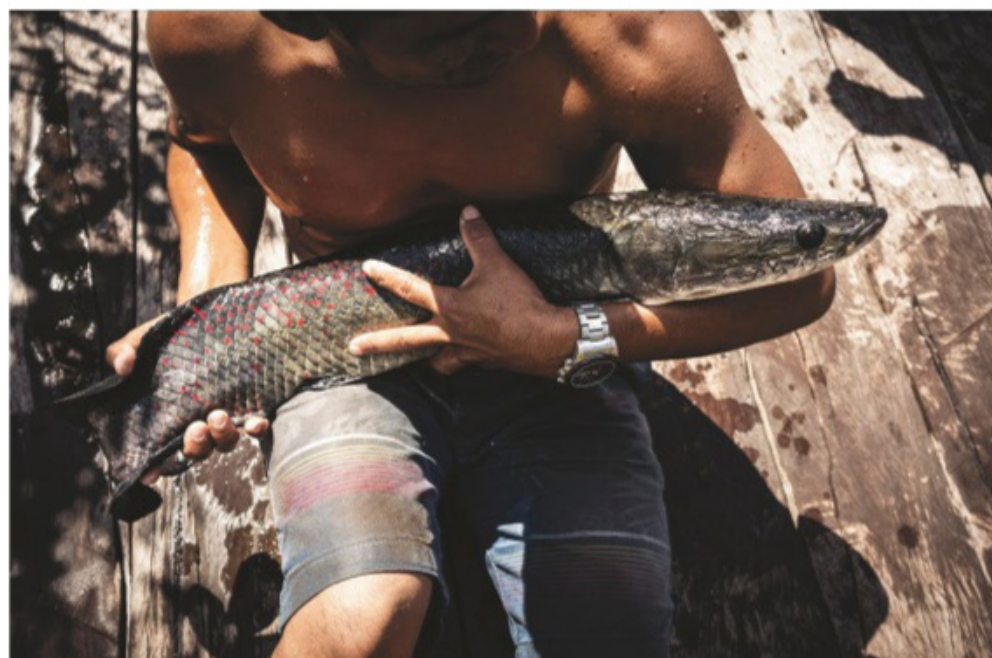


Residents are allowed to cut trees, but only for their own needs.

reserve” was established in 2009 to protect the forest and the 200 indigenous families who live here. They are allowed to cut trees, but only for their own needs. For income, they run a ferry across the Igapó-Açu River, a tributary of the Madeira River.

We meet Emerson dos Santos, 41, a round-faced, heavysset man, and his 15-year-old daughter, Érica, who comes running with a wriggling fish in her hands. “The best fishing in the world!” says dos Santos, who built guesthouses on the river and dreams of sustainable tourism in Igapó-Açu. But for that he needs guests, he says, and guests need a good road. Like all the residents we met, dos Santos was ambivalent about BR-319. He wants it to be rebuilt—for ambulances and police, for tourists—but he does not want the road to bring industrial mining and logging

João Araújo de Souza, who grew up in a riverfront town along the highway, holds a large fish known as a pirarucu.



Editor's note: Translated from the German by Elias Quijada. A version of this article appeared in the Swiss weekly Das Magazin.



< A river dolphin swims up to a dock at the sustainable development reserve along the Igapô-Açu River, or “river of the big-flooded forest.”



> A jaguar skull attests to the prevalence of wildlife in the reserve, which includes dryland forest, savanna, blackwater and natural flood plains.

Residents of Igapô-Açu catch a tiny bagre, a type of catfish, before releasing it back into the water.





Realidade is booming, but most of the logging is illegal.

operations. In de Souza's words, dos Santos wants to "suck on sugar cane and at the same time to smoke it."

We set off again, and at Mile 215 we cross a bridge over Buraco da Cobra, the Snake Pit, where the skeleton of a truck lies in the bed of a creek below. It's said that the driver was never found—only his half-eaten backpack. At Mile 233 is Toca da Onça, the Wildcats'

Lair. Motorcyclists go missing here, ambushed by panthers. Before long, we enter Nascentes do Lago Jari National Park, one of the world's most biodiverse forests. As many as 1,000 tree species can be found in one square kilometer, roughly the same number of species as can be found in the entire United States. Capuchin monkeys jump from tree to tree as we pass through.



^
In the past decade, an average of ten miles of “unofficial” logging roads have been developed each year in the vicinity of Realidade.

>
A truck hauling fish bogs down on BR-319—a common occurrence. Paving the road would improve travel, among other benefits. But at what cost?

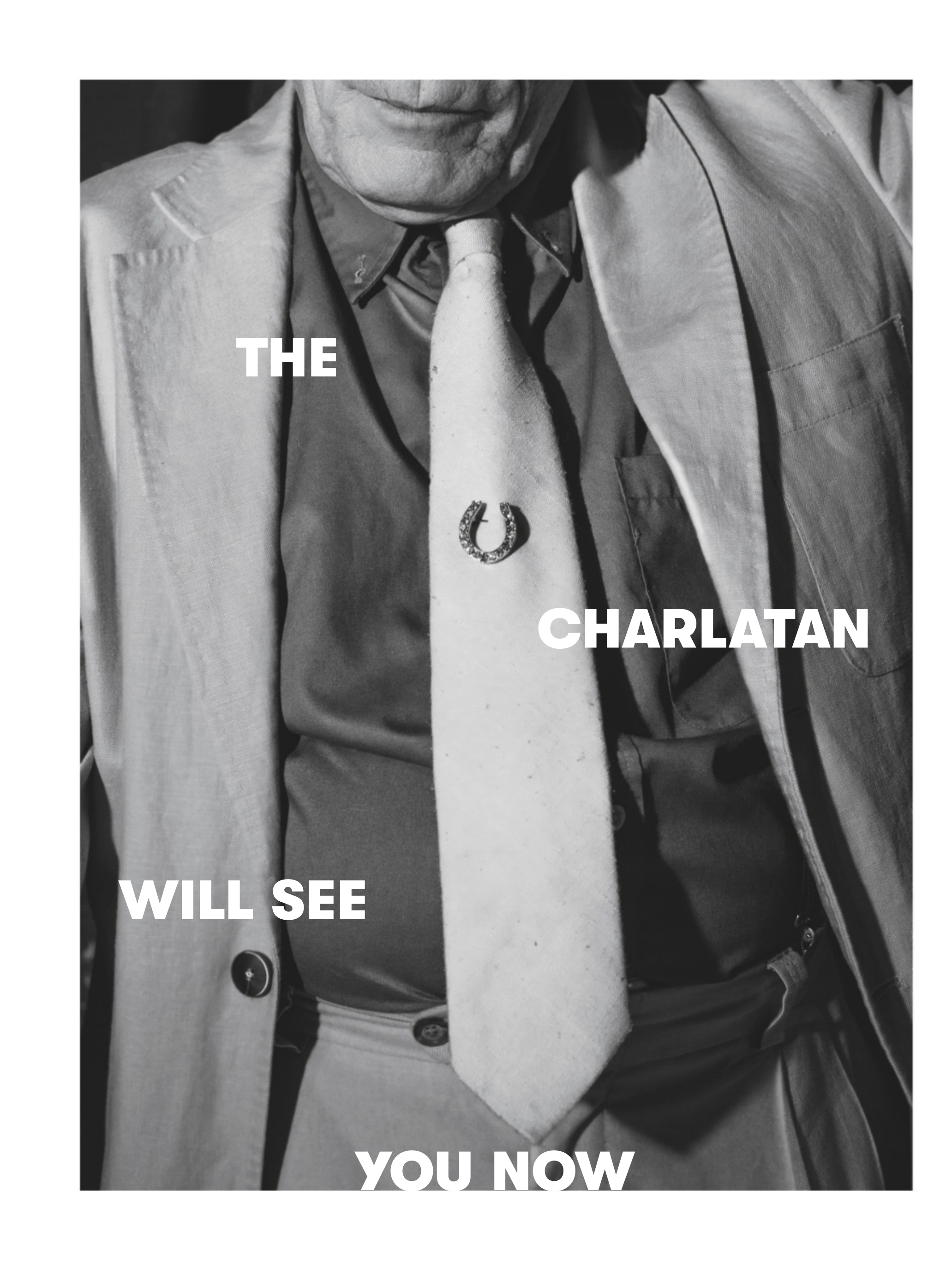


At 300 miles, the ground becomes firmer, the pot-holes fewer; someone has been fixing them up. An excavator, like that used at a construction site, appears as if out of the undergrowth. We see a narrow corridor gouged into the forest. “That wasn’t there two weeks ago,” says de Souza. Within a few miles we see dozens more corridors. Tree trunks are piled on cleared forest grounds. Farmland appears on the edge of the road, then cattle and stables. Signs claiming “private property” stand along the road, even though that is not possible: We are in a national park.

Realidade, a town first settled in the 1970s, has become a logging boomtown in the past five years. Yet most of the logging here is illegal—the land falls under the protection of Brazil’s “forest code,” which in recent years has tightly restricted private land use in the Amazon. We’re told that investors are buying up huge tracts, and pay loggers 100 reais per day—the equivalent of \$25. Tractor-trailers, excavators and other heavy machinery followed, which are used to pull down trees. Eight sawmills have opened. Some 7,000 people are now living in this illicit frontier town.

At a small hotel, we meet a tired, warmhearted 50-year-old named Seu Demir. When he arrived here “at the end of the world,” he says, there were only a few houses. People gathered Brazil nuts and sold them in Humaitá, a city to the south. Demir bought a piece of land for the cost of a meal and founded the inn. Two years ago, he acquired more land, 60 miles to the north—some 2,000 acres in Lago Jari. The land lies within protected forest, less than seven miles from BR-319. Using machinery provided by investors in São Paulo he is now opening a corridor. Among the most valuable trees on “his” property are *itaúba*, a precious wood for shipbuilding, *cedrinho*, for homes, and *angelim*, for furniture. Some of the trees are more than 800 years old.

Isso é realidade, I thought. This is reality. ♦

A black and white photograph of a man from the chest up, wearing a light-colored suit jacket, a dark shirt, and a light-colored tie. A horseshoe-shaped brooch is pinned to the tie. The man's face is partially visible at the top. The text "THE" is overlaid on the left side of the image.

THE

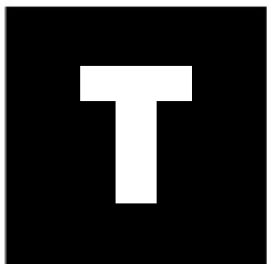
CHARLATAN

WILL SEE

YOU NOW

**A NOTORIOUS QUACK PEDDLED
CURES AT AN ARKANSAS HOTEL IN
THE 1930S. NOWADAYS THE CON
GAME IS ALL FOR SHOW**

Photographs by
ANTONE DOLEZAL & LARA SHIPLEY
Text by
JEFF MACGREGOR

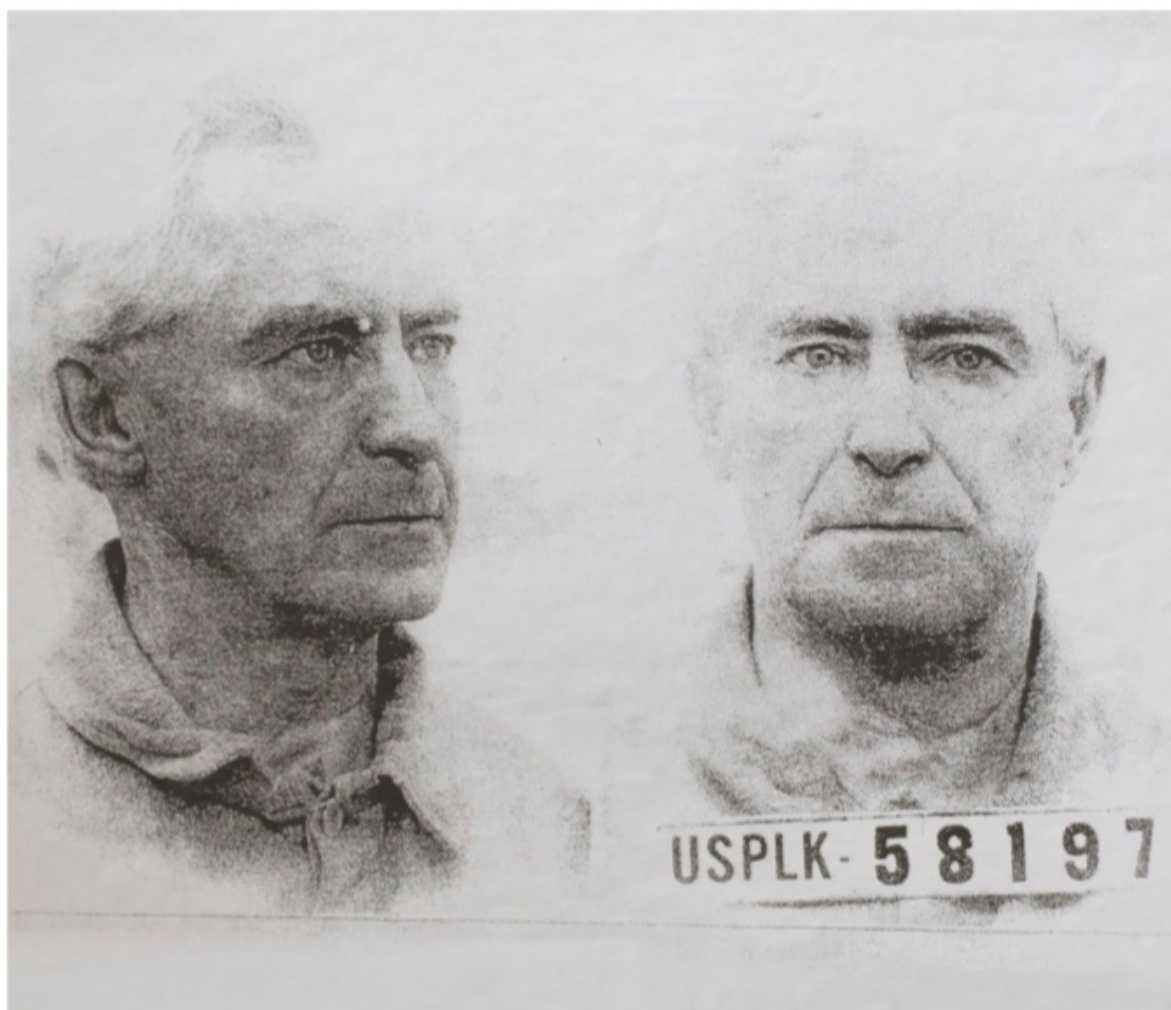


HEY FOUND THE BOTTLES buried on the edge of

the woods behind the hotel last spring. Specimen bot-

tles mostly, each about the size of a jam jar give or take,

many intact, some still filled with clear liquid yellowing to brown then molasses black, the wax and rubber seals of the glass stoppers cracked but somehow holding after 80 years in the ground; others pristine, as if they'd just been shipped from the lab. In the first hour or so the groundskeeper unearthed scores of them, but even in the bright light of morning it was impossible to judge which body parts they held. By the end of that day the staff had pulled hundreds from the tree line down the hill and everyone in Eureka Springs knew what they'd found. The next day everyone in Arkansas knew and by the end of the week everyone in America knew they'd found bottles and jars and "body parts" behind the Crescent Hotel, and that the sheriff and the coroner had come and gone, and the archaeology team from the university in Fayetteville was on its way.



COURTESY 1886 CRESCENT HOTEL & SPA (2)



Before Norman Baker was imprisoned in 1940, he amassed \$10 million selling false hope to people with cancer, promising recovery in six weeks.



IN THE LEANEST YEARS OF OUR HISTORY, HE DOESN'T HIDE THE MONEY. HE IS THE PICTURE OF VULGAR AMERICAN EXCESS.

BUILT IN 1886, the Crescent Hotel in Eureka Springs, Arkansas, is the grandest resort in the Ozarks. By the time of the Great Depression it sits empty. In 1937 it becomes the Baker Hospital. Norman Baker claims to have a cure for cancer. The colorful mailers and brochures he sends out refer to the area as the “Switzerland of America,” under the cheery banner, “Where

Sick Folks Get Well,” and promise that cancer is curable without the knife or radium or X-ray. But Norman Baker is a quack. That’s why the medical board ran him out of Iowa, then chased him down to Mexico.

Norman Baker is not a doctor. Norman Baker is a charlatan.

He is conventionally handsome. Sharp-featured

Elaborately designed to rival any French chateau, the Crescent Hotel was completed in 1886. Baker’s clinic moved in during the Depression.

**FOLKS CLAIM TO HAVE SEEN THE GHOST, A WHITE
RADIANCE PLUMMETING FROM DARKNESS TO DARKNESS,
AND THEY WONDER . . . WAS SHE PUSHED?**



Baker's Crescent Hotel office is now a guest room. The tragic crimes he committed figure in the facility's marketing campaign as "America's most haunted hotel."



< Keith Scales, who plays Baker in a one-man show, says the key to his portrayal is the chip on his subject's shoulder: "Every day he is battling someone."



and clear-eyed. Confidence-inspiring, straight out of a B-movie casting call, he has a well-cut head of distinguished gray hair and a strong jaw balanced on a celluloid shirt collar. Is the gaze level? The handshake firm? Are the palms cool and dry? You bet.

His patients—the suckers and the gulls and the true believers—are weak with sickness, desperate, pale. They come from everywhere, and pay cash for the treatments. They pay and pay. Baker promises life, he promises vigor. No surgery. No radiation. Just Formula 5 and the power of positive thinking.

Baker drives a hand-hammered, coach-built Cord automobile custom-painted in electric lavender. He wears dark chalk-stripe three-piece suits in winter, white suits and matching shoes in summer. Lilac shirts year-round. He sports a diamond horseshoe stickpin and a watch fob heavy as an anchor chain.

In the leanest years of our history, he doesn't hide the money he gifts from the sick and the hopeless, he broadcasts it. He brags it. He is loud with it. He is the picture of vulgar American excess.

— **"FORMULA 5" IS ALCOHOL**, glycerol, carbolic acid, ground watermelon seed, corn silk and clover leaves. It is administered by injection at the site of the cancer—up to seven times a day. Baker stole the recipe from another con man. It does nothing.

— **ILLNESS IS AN ISLAND**. There is no loneliness like sickness. You feel it in these rooms. Not isolation, but desolation.

— **THE CRESCENT, RESTORED**, is still open and more popular than ever. In part because it bills itself as America's Most Haunted Hotel. On the ghost tour they tell you these stories: Michael, the stonemason flirt from Ireland falling to his death during the hotel's construction, now and forever romancing guests in Room 218; Breckie, the 4-year-old boy taken up by illness a hundred years ago, lately playing in the hall and photobombing tourist selfies and snapshots; Theodora, 80 years dead and still trying to find her key in front of Room 419, an obsessive-compulsive packer of guest suitcases when angry; the Nurse, pushing a gurney through eternity on the third floor; and perhaps most famously, the Girl in the Mist, who from time to time to time—always around 10:30 in the moonlight—will fall or fling herself from one of the east side

balconies into the garden below. She is shrouded in mist as she falls, as is her story. There's no record of an event like this at the hotel, but folks claim to have seen the ghost, a white radiance plummeting from darkness to darkness, and they wonder . . . was she pushed? Did she jump? Was she—is she—a character straight out of Dreiser, pregnant and unwed and ruined, killed by despair and Victorian convention?

Here the implausible yields to history, as the hotel was, for a few years anyhow, a distinguished college and conservatory for young women. From 1908 until 1924 the hotel bolstered its summer tourist revenue by becoming a destination boarding school for the edification of American womanhood. According to the *Encyclopedia of Arkansas*, an early advertisement in *Cosmopolitan* magazine reads as follows:

“Crescent College and Conservatory for Women. On top of the Ozarks. Famous for healthfulness and beauty of location. \$300,000 fireproof building. Rooms with private bath. Elevator. Accredited Junior College. General courses; art, music, expression, domestic science.”

But there's no evidence that any fallen or falling woman was a student.

—
ON THE FOURTH FLOOR, in what used to be the faculty lounge, is now a small museum and library where the history of this place is made vivid. Historian and artist and storyteller Rebecca Becker keeps the memory of the conservatory days alive. There are exhibits and display cases and even a small stage. And Keith Scales is in charge of the ghost tours that begin here, and the ghost stories, and they work together to make the hotel the lively old dame she is.

The Ozarks are a crossroads, and over the last 10,000 years or so Eureka Springs has attracted pilgrims and seekers of every kind. It was said the waters healed the sick and made you whole again, so the Osage chief who carved out the holy basin next to the spot where the Basin Park Hotel now stands on Spring Street would recognize the impulse if not the architecture. This has always been a boom-and-bust town and a hide-out and a rest cure, a place to lay low or live high. Bank robbers, bootleggers, railroad magnates and cathouse madams all made their fortunes here. Gangsters from Chicago kept the hotels and roadhouses and nightclubs busy after World War II, and when the local economy swooned in the 1970s, hippies saved the place and its storied gingerbread homes and it became an arts oasis. It remains so.

Over the years, Scales has performed a one-man Norman Baker show many times on that small upstairs stage. He and Becker do their best to make the Crescent a history project rather than merely a haunted house.

In addition to the ghost tours and the haunted hotels and the springs and the baths, Eureka Springs has galleries and restaurants and bars and a beautiful old Carnegie library. There is a Passion play here



A stairway at the base of Crescent Spring, one of the 62 mineral springs that began attracting health buffs and patients to the area in the 1880s.



Is it a narwhal tusk? A letter opener? An antique drill? It's a mysterious time capsule at the Crescent Hotel, sculpted by Bob Rees and scheduled to be opened in 2100.



as well, and an opera company, and the Christ of the Ozarks statue, seven stories high.

—

THE ERODED OZARKS PLATEAU upon which all this rests is hundreds of millions of years old. Walk ten feet into the trees and you're part of prehistory. The woods resonate with that ancient animism. The forests hum with it. You can hear them breathe.

There's something heavy in the quiet here, though, some weight to the air. Especially at sundown, or right before dawn when the mist hangs in the cuts and hollows. There's something eerie in it, dreamlike, something deep and uneasy.

In the hotel, it's the same. Every stairwell and landing is fraught, every empty hallway feels crowded, and every room you enter feels as if someone just left. You are alone but never alone here. And to the suggestible, to the willing, that's the point of the place. To be a little frightened by the supernatural. To feel alive in the company of the dead. In the dark, everything is a ghost story.

But even the skeptical are moved here—if not to fear then to sadness. The sharp historical sense of dread and of pain and of loss can be overwhelming if you open yourself to it. Because worse than any monster is a man like you or me. Weak. Greedy. Unaccountable. Selling

hope to the hopeless. If you checked in to the Baker Hospital, your room holds everything you ever lost.

—
THE MORGUE SMELLS OF DUST. It smells of dampness and dust and stone. It holds the heat of the day in the front room, but the farther in you walk, the cooler it gets. The morgue is not in the basement, but it is dark and low-ceilinged and you imagine the weight of the hotel on top of you. The refrigerator where they kept the bodies is the last stop on the ghost tour. In an alcove are shelves with more of the specimen and sample jars of the kind that were found down the hill. Many of these hold indeterminate bits of flesh and were displayed in the lobby of the hotel when it was the cancer “hospital.” There was a “ghost sighting” in this room—right where you’re standing—on a recent ghost-hunters’ TV show. It plays on a loop behind you.

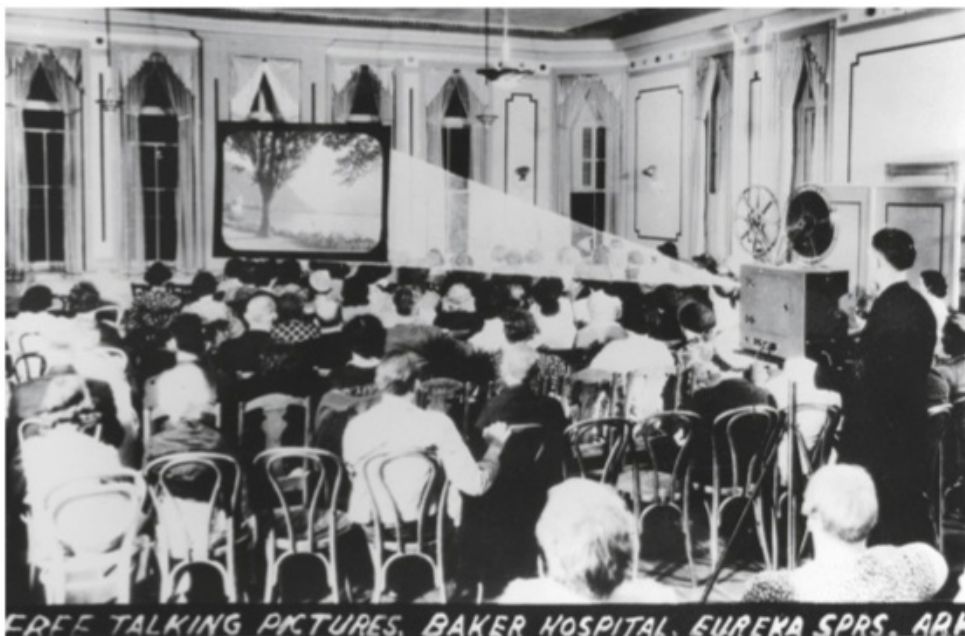
There’s a commercial kitchen utility counter and sink against one wall, which some people mistake for an autopsy table. The morgue was probably a pantry, but for the few years of Norman Baker’s Cancer is Curable Hospital, the dead were brought down here to wait for the hearse from the local funeral home.

On the day Germany invaded Poland, September 1, 1939, Norman Baker was arrested for mail fraud. That’s how they got him: the brochures. He was tried and convicted and sent to Leavenworth. Norman Baker was a charlatan in the long terrible tradition of American charlatans. A liar and a thief who sold broken promises. Norman Baker died a Florida retiree in 1958. He had cirrhosis. And cancer.

—
“I THINK THEY’RE PIG PARTS,” Scales says of the contents of the specimen jars. Not surgical excisions. Not even human bits cribbed from the local mortician. Pickled trims and ends bought from the local butcher, maybe; or specimens ordered from a medical school supply house. We’ll get the results once the university tests them.

➤
At the Intrigue Theater, which is in a 19th-century mansion, illusionist Juliana Fay, who describes herself as a “ghost talker,” appears to summon Victorian spirits.

▼
Baker boasted that “hospital” staff screened movies for patients. But that claim, like this composite photo in his promotional materials, was bogus.



COURTESY 1886 CRESCENT HOTEL & SPA



**ON THE DAY GERMANY INVADED POLAND,
SEPTEMBER 1, 1939, NORMAN BAKER
WAS ARRESTED FOR MAIL FRAUD.**

In the 1890s, stonemasons crafted a shrine to the healing waters of Grotto Spring. According to local myth, no one knows who lights the lantern nightly.

Faded but not forgotten, signs near the looming 1905 Basin Park Hotel advertise the old-time vibe propelling the Eureka Springs renaissance today.







▲ Baker's former bedroom at the Crescent Hotel. Keith Scales often tells stories about Baker during the hotel's ghost tours, which he also manages.

But the jars will make no sense even then, even as an advertising device. Baker claimed to cure cancer without surgery. Why bother displaying fake tumors?

Because people desperate to be persuaded don't think. They want to be convinced. They want to be sold. They want to believe. Because they ache to live. And maybe that's what you get from coming here, from every one of these ghost stories. A lesson in longing.

Life persists. Life insists on life.

So maybe in the middle of that first long night you wake. You fumble for the light and walk to the window. Behind you the old hotel creaks and groans. Outside, the invisible valley is all silence and darkness. What you see on the glass is your own reflection. The only ghost in this room is you. ♦

BYLINES **Jeff MacGregor**, *Smithsonian* writer-at-large, recently profiled race car driver Danny Thompson. Collaborating photographers **Antone Dolezal** and **Lara Shipley** focus on folklore, history and rural culture.



➤ A view of the Ozarks from one of Baker's rooms, popular today with fans of the paranormal. What is it about swindlers that so fascinates Americans?

**BECAUSE PEOPLE DESPERATE TO BE PERSUADED
DON'T THINK. THEY WANT TO BE SOLD. THEY WANT TO
BELIEVE. BECAUSE THEY ACHE TO LIVE.**





THE navigator

A SON DISCOVERS THE ASTONISHING HEROISM
OF THE U.S. MISSION TO BOMB A NAZI WEAPONS
FACTORY IN CZECHOSLOVAKIA

by BRIAN MOCKENHAUPT



THE WAR COULDN'T LAST MUCH LONGER. Any day now a cheer would sweep across the airfield. No more missions, no more dice rolls, no more terror in the sky.

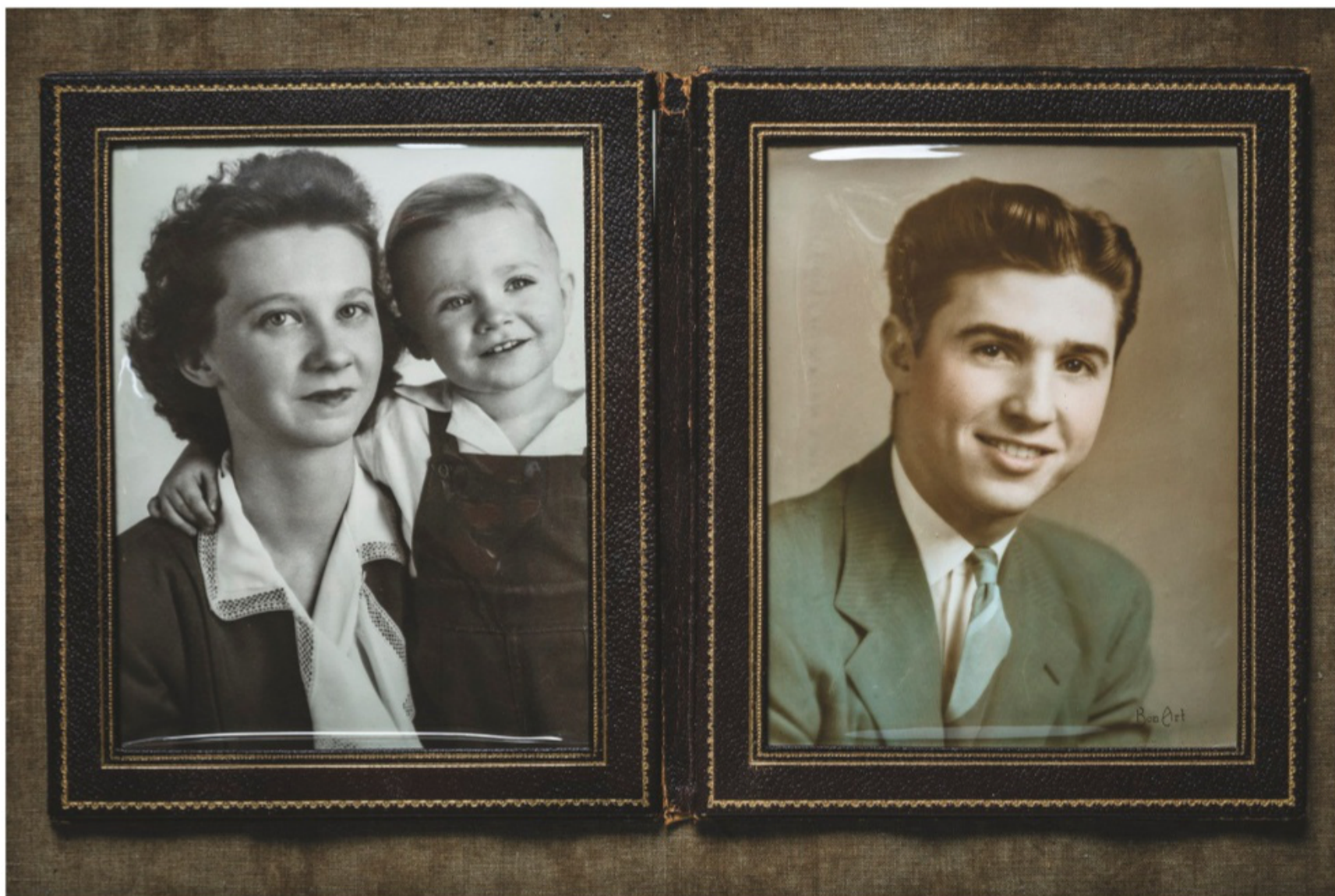
A map in the Officer's Club showed the advancing front lines, with Germany nearly pinched in half as the Americans and British pushed in from the west and the Russians squeezed from the east. Bombers had already destroyed much of military value to the Germans and flattened wide swaths of several cities. But still the Germans fought on.

At 2 a.m. on April 25, 1945, an orderly woke Second Lt.

photographs by DAN WINTERS



John Hesley at home in Texas with wartime photos and letters from his father.



William Hesley and told him to get ready to fly. Hesley had joined the war late, just four months earlier, but 24 times already he had choked down an early-morning breakfast at Podington Air Base, north of London, and crowded into the briefing room, waiting for his fate to be revealed.

An intelligence officer slid the curtain aside, from left to right across the map, farther and farther, all the way beyond Germany to their target in western Czechoslovakia. Once over the city of Pilsen, the B-17 Flying Fortress crews would drop their 6,000-pound payloads onto Skoda Works, a massive 400-acre factory complex that had armed the Austro-Hungarian Empire in World War I. Ever since the Nazis had taken over Czechoslovakia in 1939, more than 40,000 Czech civilian workers there had built tanks and cannons, machine guns and ammunition for the Germans. Allied bombers had tried several times to destroy it, without success.

In the spring of 1945, the Americans and Brits had another motive for destroying the factory: Once the war was over, they didn't want the Russians to dismantle the factory for industrial production at

Left, John and his mother, shortly after his father disappeared. John notes: "She looks like a woman whose husband has died." Right, William Hesley circa 1941.

home, which made the mission one of the earliest chess moves of the Cold War.

On the flightline, Hesley hoisted himself into a B-17 named *Checkerboard Fort*. He settled into the navigator's station at a tiny desk beneath the cockpit and just behind the bombardier's position in the plane's plexiglass nose. He had never flown with this crew before. Indeed, Hesley, who had turned 24 three days earlier, hadn't been scheduled to fly this day, but had volunteered to take the place of a sick navigator. This mission happened to fall on his third wedding anniversary; with a little luck, he'd soon be home in Paris, Texas, where Maribelle waited with their 2-year-old boy, John.

The pilot, First Lt. Lewis Fisher, gunned the four massive engines. The bomb-laden plane lifted off the runway and the English countryside faded beneath them. Fisher slid into a miles-long formation of 296 B-17s and crossed the English Channel. Hesley spread out his maps and charts and busied himself with calculations for what would be the Eighth Air Forces' last bombing mission of World War II.

Their orders for Pilsen were for visual bombing only, which meant the bombardiers had to see the target clearly. The alternative is area bombing—close enough is good enough. Bombing industrial targets in Germany, the Allies weren't as concerned about

BYLINES

Brian Mockenhaupt, an Iraq War veteran, is a contributing editor to *Outside* magazine. *Smithsonian* previously published **Dan Winters'** award-winning photo essay on a World War II vet.

“SAYING GOODBYE TO YOU WAS THE HARDEST THING I THINK THAT YOUR DADDY EVER HAD TO DO. BECAUSE IN HIS HEART HE KNEW IT WOULD BE THE LAST TIME HE WOULD EVER BE WITH HIS SON ON EARTH.”

whether their bombs fell into neighborhoods. The British frequently hit civilian areas to break the German will to fight, and as the war dragged on the Americans broadened their targets as well. But the Czechs were not the enemy, and killing thousands of them could only sow ill will and slow their recovery from years of war and occupation. Better to risk few and save many.

Some of the bomber radio operators tuned into the BBC broadcast to break the monotony of another long flight and to keep their minds off the artillery shells that would soon splinter the sky, the shards of shrapnel that might rip through their planes’ thin aluminum skins. Far from calming their nerves, what they heard chilled them. “Allied bombers are out in great strength today. Their destination may be the Skoda Works,” an announcer said, the first time in the war the Allies had issued a warning before a major bombardment. “Skoda workers get out and stay out until the afternoon.”

The warning would likely save thousands of civilians, but it also told the Germans where to concentrate their defenses. For the aircrews rumbling toward Pilsen, their chances of surviving this last mission just took a serious hit.



WAR HAS BEEN FOUGHT on land and at sea for millennia, but World War II brought it fully into the skies with strategic bombing, meant to destroy a country’s economy and infrastructure and crush its people’s will to fight.

The British, who favored nighttime bombing, couldn’t accurately hit precise targets in the dark. Instead, they blanketed German cities with bombs, as the Germans had done to them. But with the high-tech Norden bombsight, the Americans were sure they could knock out specific targets, like armament factories and railroad yards—and do it without fighter escorts.

Though the B-17 bristled with a dozen or more .50-caliber machine guns from nose to tail, proponents of unescorted daylight bombing overestimated the plane’s ability to defend against the German fighters, which darted through formations and tore into the bombers.

On an October 1943 mission to destroy several ball-bearing plants in Germany, 60 B-17s were shot down, which left 564 empty bunks that night at air bases across England. That same week in a raid over Munster, the 100th Bomb Group, nicknamed “The Bloody Hundredth,” lost 12 of 13 bombers.

And the losses kept piling up. During the air war over Europe, the Eighth Air Force would suffer more than 26,000 men killed in action—more than all the U.S. Marines killed in the South Pacific. Still, Hesley figured it better than the alternative. “If I have to die,” he told Maribelle, “better up here in the air than down in the mud.”

Before leaving for England in late 1944, he wrote a letter for her to read to John on his second birthday, the following April. It was the sort of letter meant to be read through the years, full of expressions of love and pride, and hopes for the man his son would become. “In case anything should ever happen to daddy either now or later on in life,” he wrote. “I want you to always take care of your mother for me.”

But he reassured his son that he’d be home soon, that everything would be fine, something a little boy could understand.

“Saying goodbye to you was the hardest thing I think that your Daddy ever had to do,” Maribelle wrote in a letter for John’s 21st birthday. “Because in his heart he knew it would be the last time he would ever be with his son on earth.”

“After he left, you and I pretended he was there living with us. It was the best way I knew to get you ‘acquainted’ with him while he was gone. Because I knew that he would be back, just as strongly as he knew that he would not.”





MARIBELLE FIRST SAW WILLIAM at a dance at the Gordon Country Club in 1941. She was home on spring break from Texas Christian University. He worked as the night manager at a hamburger joint called Green Castle. She told her friend Jeanne that was the man she would marry, never mind that she hadn't met him yet.

They married the next spring. He enlisted in the Army a few months later and volunteered for flight school. After his initial single-engine pilot training, he was assigned to be a navigator. Not as glamorous as being the pilot, this was the toughest job on the plane, getting the crew to the target and then back home. Hesley had to know the plane's exact location at any moment, through tracking airspeed and direction, noting terrain features on the ground, triangulating radio signals and even using the stars by looking through a plexiglass bubble above the navigator's desk.

The conditions were miserable. The plane flew at about 25,000 feet, and wasn't pressurized or heated. Oxygen masks often clogged with ice, and exposed skin could freeze in minutes.

By the time Hesley came to the war, in January of 1945, the Luftwaffe wasn't nearly the threat it had been, crippled by fuel shortages, a lack of experienced pilots and relentless attack by the Allies. The introduction in

▲ American B-17s fly over Wittenberg, Germany, in 1945. Apart from the plane in the foreground, all the bombers pictured here belonged to Hesley's squadron, the 327th.

late 1943 of the P-51B Mustang, a fighter capable of escorting the bombers deep into Germany and back, had greatly reduced the effectiveness of the Luftwaffe. But the anti-aircraft guns remained just as dangerous as ever.

The Germans tracked the incoming bombers with radar and fired ahead of the planes, the way a hunter leads a flying duck with a shotgun. To counter this, the formations changed course frequently as they flew over enemy territory, forcing the Germans to constantly change their firing coordinates. This kept Hesley and the other navigators busy, plotting flight adjustments that zigzagged them toward the targets.

Once the bombers were over the target area they couldn't change course, and the Germans could throw up a barrage of shells, creating an enormous aerial box of shrapnel. The air crews could do little but hope that a shell wouldn't find them, and that their flak jackets and steel helmets would protect them from the shards of metal. The Flying Fortress was tough, able to fly with two and even three engines out. They regularly returned to England peppered with holes, and sometimes with whole chunks of plane shot away. But many erupted into fireballs or spiraled down, out of control, as men in other planes watched and waited for little white flashes of parachutes.

Even without enemy fighters and flak, just getting to and from the target was incredibly dangerous.

Flying over Dresden, Germany, on April 17 to bomb railroad tracks and marshaling yards, the lead squadron lost its way in the clouds and flew into the path of another group of bombers. Pilots realized the mistake too late. *Queen of the Skies* and *Naughty Nancy*, flown by Lt. John Paul, slammed together and plummeted to the ground.

Hesley had trained with Paul and his crew in America and flown with them for the first several weeks. He'd recently started filling in as navigator on different crews, so he wasn't with them that day. More dead friends and empty bunks, and no time to mourn. The next morning Hesley was over southern Germany bombing rail yards near Munich.

For the next week, with the Allies advancing so rapidly toward Berlin, hopes rose among the aircrews that they had flown their last mission. But the Skoda Works waited for them.

The complex supplied the Germans with everything from bullets and tanks to plane engines and the 88-millimeter cannons that devastated the bomber formations. The Skoda Works was so important to the Germans that they built a wood and canvas replica of the factory several miles away to confuse the Allies, who had tried several times to destroy the factory. In April of 1943, the British Royal Air Force sent more than 300 heavy bombers to Skoda, but mistakenly bombed a psychiat-

for him at the table, even after she received another telegram, on July 16, confirming that he'd been killed in action.

When John was 3 years old he asked her when his daddy was coming home. His first memory is his mother's answer. He ran to a bedroom closet with a window where he sometimes played. He looked out on the sun shining through the trees and he wept.

John knew plenty of kids whose dads fought in the war. But their dads had all come home. His mother, mired in her own grief, kept the blinds drawn, the house dark, and he often escaped to his grandparents' home next door.

Three years after John's father died, Maribelle remarried. But his stepfather, who had served in Europe with the Army, had his own struggles. Each night he'd walk into the fields near their farmhouse with a bottle of Old Crow whiskey, coming home when he'd drunk enough to sleep through the night.

She married again, in John's late teens, to a Marine who saw brutal combat in the South Pacific and talked about having to burn Japanese soldiers out of caves with a flamethrower. Between the ghost of William and two more damaged husbands, the war never let go of her—or John.

"Up until she died, he was the only love of her life, which is hell on a kid," John says of his father, sitting in the book-lined study of his home in Arlington, Texas, where he lives with his

AS HE RALLIED FELLOW PRESBYTERIANS TO OPPOSE THE VIETNAM WAR, HE THOUGHT ABOUT HIS FATHER, WHO HAD VOLUNTEERED FOR SUCH DANGEROUS DUTY, AND WORRIED WHAT HIS MOTHER WOULD THINK.

ric hospital in the nearby town of Dobraný—and lost 36 planes.

April 25 was supposed to be a bluebird day, perfect bombing weather. The scout planes reported clear skies, but they had gotten lost and were reporting the weather over Prague. When the formation arrived over Pilsen in the late morning, they found the city clouded over.

The Germans couldn't see the bombers, but they could hear them and watch them on radar. They fired barrages of shells that pockmarked the sky with ragged black puffs of smoke and showers of shrapnel.

The bombers started their run toward the Skoda Works, hoping the clouds might part, just for a quick moment. No luck.

Bombardiers eased their fingers from the release toggles and pilots made the stomach-churning announcement to their crews: We're going around again.



THE WAR IN EUROPE ENDED on May 8 and Maribelle received the telegram on May 11. "The Secretary of War desires me to express his deep regret that your husband 2/LT Hesley William has been missing in action over Czechoslovakia since 25 April 45."

Maybe he'd bailed out and been taken prisoner. She kept the same routine she started after William left, setting a place

wife, Jan. He has a lean runner's build, silver-streaked hair and a smile that starts at the eyes. He speaks slowly and softly, his voice tinged by a lifetime of Texas living. "You're growing up and he's perfect," he says. "You can never be perfect."

John played football, even though he was small, to feel like less of an outsider, to show the other kids he could be just like them, even without a father. He earned starring roles in school plays and was elected class president, several years running.

Yet he felt his own time was running out. He had convinced himself that he would die young. As his family's sole surviving son, he was exempt from service in Vietnam, but in college he passed the test to start naval flight training. Since his father died in a plane in combat, maybe that should be his fate, too.

But before he signed the final papers, he thought about the high likelihood that he would be killing civilians. He wondered if the killing had bothered his father. Maribelle had told John a story about squishing a bug while she and William sat on a park bench when he was in pilot training. "Why did you do that?" he asked. "You shouldn't do that, killing things."

Hesley had mostly bombed factories that produced war materials and the railways that moved soldiers and supplies. But by the winter of 1945, the Americans had broadened their target lists to include cities. On February 3, Hesley's crew joined a 1,000-bomber armada from England that pummeled Berlin,



an occasion when American bombers directly targeted civilians. How had his father felt about dropping bombs on people in Berlin, John wondered, like so many helpless little bugs down below?

John changed his mind and enrolled in a Presbyterian seminary, where his conscience was stirred by the civil rights and antiwar movements. As he rallied fellow Presbyterians to oppose the war, he thought about his father, who had volunteered for such dangerous duty, and worried what his mother would think of her son choosing the opposite course.

"If your father were alive, he would agree with you," his mother told him. "This is not a good war."

John served as a minister for several years, then trained as a clinical psychologist. Over the years he worked with several veterans, helping them process what they had seen and done in war. One man was haunted by the killing he'd done in Vietnam and felt he'd lost his humanity. A sailor, swallowed up by depression, wanted to go back to war, where he felt useful. A woman struggled with survivor's guilt

▲ Skoda Works, top, during the April 1945 bombing, which also destroyed nearby civilian homes and Pilsen's town center. Bottom, the factory, in ruins.

after watching her best friend die in an explosion.

All the while, as he helped ease their burdens, he kept his own grief and loss tucked away.



THE ALLIED WARNING broadcast on the BBC was unusual for its time. The Hague convention of 1907 had stated, "After due notice has been given, the bombardment of undefended ports, towns, villages, dwellings or buildings may be commenced." During World War II, few targets were considered "undefended," since each side had radars and war planes at the ready. In 1945, Americans did drop leaflets into Japanese cities, urging civilians to end the war or face "the most destructive explosive ever devised by men." But the leaflets didn't specify that the attacks would be on Hiroshima and Nagasaki.

Skoda Works was different. The target was not on enemy soil but on land occupied by the enemy. The Allies issued a specific warning, even though it



would give the Germans time to bring in reinforcements to the anti-aircraft guns arrayed near Pilsen. With the formation stretched out for miles, the German gunners had a nonstop stream of targets.

In another squadron farther back from Hesley in the formation, several planes found a break in the clouds and had been able to drop their bombs on the first pass, but the commander's plane hadn't dropped its bombs, and he ordered his squadron over the radio to make another pass with him to maintain the integrity of the formation.

"If you are going back over again," a pilot told him, "you are going alone."

"Be quiet," the commander said. "We are going around again. I don't want to discuss it. It's an order."

"I'm married and have a little boy," the tail gunner in another plane told his pilot. "I'm not going through that again. If you go around, I'm bailing out."

The pilot wanted nothing to do with another run. He broke from the formation and started back for England with several other planes.

▲ The remains of the factory in July 1945. Before the war, Skoda Works produced everything from machinery for European breweries to sluices for the Suez Canal.

But most hadn't been so lucky. They still had bombs to drop, so they looped around and lined up for another run through the field of flak.

Checkerboard Fort, with Hesley huddled at his navigator's desk, didn't fare any better on the second pass. Clouds still covered the target. The bomb bay doors closed and the pilot, Lt. Fisher, banked the plane for an almost unheard of third pass. Fifteen minutes later, at around 10:30 a.m., they were lined up for another run. Fisher opened the cockpit door and called back to the radioman. "Hey, Jerry," he said, "take a look at what we've got to fly through."

From his little radio room behind the bomb bay, Jerome "Jerry" Wiznerowicz peered through the cockpit window at a sky blackened by explosions. In all his missions, he'd never seen it so bad. "Holy Christ almighty," he said. "We're not going to make it."

On this third run, the clouds had parted over the Skoda Works complex. Neal Modert flipped the toggle switch and bombs poured from the belly of *Checkerboard Fort*.



A piece of melted aluminum from Hesley's plane, *Checkerboard Fort*, found at the crash site.

Many of the crews hit the mark. Six people were killed on the factory grounds, and errant bombs killed 67 civilians in the city. But the bombers annihilated the Skoda Works, destroying or heavily damaging 70 percent of the buildings. Despite the chaos in the skies, the mission was turning out to be a great success.

Fisher banked the plane and they headed for home.

A moment later, an 88-millimeter shell tore through the two

engines on the left side. The bomber tipped into a dive and Fisher rang the bell for everyone to bail out.

Crews in other planes saw *Checkerboard Fort* spin off to the left of the formation. A few P-51 escorts followed it down, looking for parachutes, until it disappeared into the clouds at 15,000 feet.

Just as Wiznerowicz fastened his parachute the plane exploded and broke in half. He fell out and tumbled through the sky.

The blast blew Modert through the plane's plexiglass nose.

HIS BREATH CAUGHT WHEN HE SAW THE RAGGED-EDGED PIECE OF WING,
ABOUT 4 FEET WIDE AND 9 FEET LONG. HE RAN HIS HAND ALONG THE
METAL THAT HAD CARRIED HIS FATHER HERE FROM ENGLAND.

Though injured by flak in the shoulder, he was able to pull his chute. Hesley and everyone else were trapped inside as the two burning halves of *Checkerboard Fort* pinwheeled through the clouds.



LAST SEPTEMBER John finally opened the box.

Preparing for his home office to be recarpeted, he emptied the closet where he'd stored it after his mother's death 20 years earlier. He had seen many of the items before, like the two letters his father and mother had written to him, and the photo of the family walking down a street in Texas, Maribelle in a plaid dress, William in his uniform, with his son in his arms.

But he hadn't before been ready to consider them in totality, and the story they told about his father, and himself.

John unrolled a three-foot-wide panoramic photo showing his father with his class of more than 200 men as they started navigator training in Southern California on April 25, 1944—his second wedding anniversary and a year to the day before his last mission.

He sifted through pictures his dad had with him in England, which were sent home after he died. John, a few weeks old, held aloft in his father's hands. As a toddler, with an officer's cap covering his head. More of him, playing and smiling, and photos of B-17s in flight, surrounded by flak explosions, stacks of bombs pouring from their bellies.

Maribelle had clipped a dozen newspaper articles about air

raids, no doubt wondering if her husband had taken part in the attacks, if he was safe, or among the crews lost: "1,200 Heavies Hit Reich"; "1,300 8th Heavies Again Blast Reich as Nazis Hide"; "8th's Blow Sets Berlin Ablaze."

She had saved their marriage announcement from the local paper, and a final clipping:

"Death of W.F. Hesley Confirmed; Wife Notified Here Monday; Died Over Czechoslovakia"

John found the two Western Union telegrams reporting his father missing and then killed in action, and a half-dozen official letters of condolence. "Words can do little to ease your grief," Gen. Hap Arnold, commander of the Army Air Forces, wrote, "but I hope you will be comforted by the thought that your husband faithfully fulfilled his duty to his Country."

From the den of his home in Texas, Hesley searched the internet, reading histories of the bombing campaign in Europe, firsthand accounts from air crews, and stories about the last mission over Pilsen. For the first time he started to understand the horror of what his father had experienced. "I was overwhelmed by it for a while," he says. "I would have nightmares, waking up in the middle of the night from dreaming about flying bomber missions."

He reached out to military historians who scoured archives. They sent him lists of all the missions his father had flown, but he still didn't know anything about his father's last hours.

The Army had told Maribelle that he died instantly, but John always thought that was a kindness, saving family members from the bloody, awful details. He imagined his father burning to death, pinned inside the plummeting plane.

A niece of the *Checkerboard Fort* tail gunner, Staff Sgt. Chris Chrest, had searched through archives and found debriefings of the two survivors, Wiznerowicz, the radio-man, and Modert, the bombardier. She sent them to John.

German patrols had captured them as soon as they landed in their parachutes, and held them as prisoners. Released at the war's end two weeks later, they filled out reports about the Pilsen mission, which included questions about each crew member and when they were last seen.

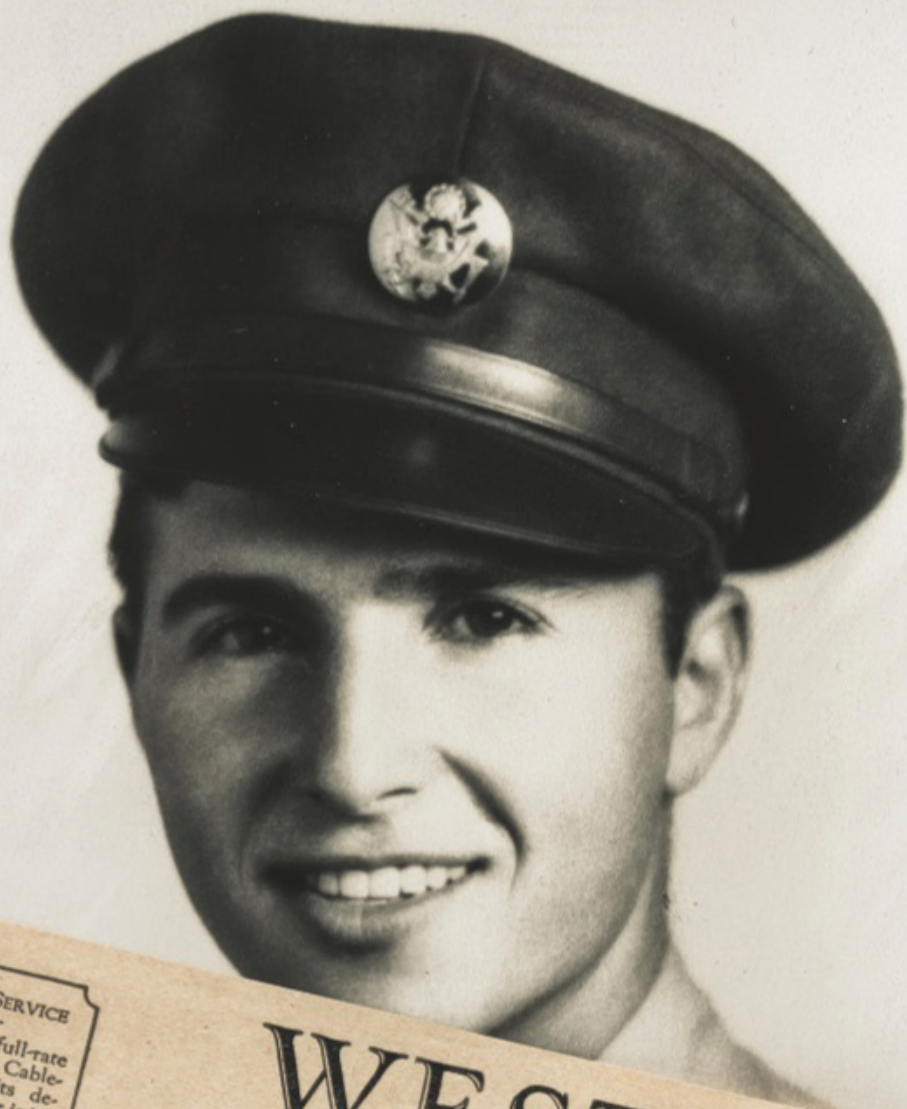
For most of the crew, Wiznerowicz and Modert reported the same fate. Did he bail out? "No." If not, why not? "Plane blew up. Pinned in and went down with the plane."

But his father's report was different. Did he bail out? "No." If not, why not? "He was killed by flak."

Relief washed over John. It was true. The



The bullet-riddled *Checkerboard Fort*, photographed in 1945 in the place where it crashed, east of the Czech village of Ceminy.



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37GOVT=WUX WASHINGTON D C 15 1005P
MRS MARIBELLE HESLEY=
205 PINE BLUFF STREET PARIS TEXAS=

1945 JUL 16 AM 7 44

THE SECRETARY OF WAR HAS ASKED ME TO EXPRESS HIS DEEP REGRET
THAT YOUR HUSBAND 2/LT HESLEY WILLIAM F WAS KILLED IN ACTION
25 APR 45 HE HAD PREVIOUSLY BEEN REPORTED MISSING IN ACTION
CONFIRMING LETTER FOLLOWS=
EDWARD F WITSELL ACTING THE ADJUTANT GENERAL.
F 25 45

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

blast that had taken out the two engines had killed his father.

His searching also put him in touch with historians in Pilsen. The city holds an annual festival that commemorates U.S. soldiers liberating the city from German forces on May 6, 1945. They invited John to attend the event as an honored guest, and to see the town the bomber crews had spared. They already knew about John's dad. In Ceminy, the little town where the bomber crashed a few miles outside Pilsen, there's a marble memorial etched with Hesley's name, and the rest of the crew who died.

John had lived so long with murky memories and scraps of information that he hadn't imagined this possibility: The story left forever unfinished when he was 2 years old might finally have an ending.

ON AN OVERCAST AFTERNOON in early May, John climbed into the front seat of a restored World War II-era U.S. Army jeep, driven by a Czech man dressed as an American soldier. A little convoy of old U.S. military vehicles loaded with local politicians and a dozen more re-enactors drove into the hills above Ceminy, a town of 250.

They stopped near a forest at the edge of rolling farm fields and gathered around a depression plowed out seven decades earlier when *Checkerboard Fort* slammed into the ground with William Hesley inside.

In the weeks leading up to their trip from Texas, John hoped that he and Jan might experience this moment alone, that he might grieve his father in private. But he understood the significance of his visit for a city still grateful for its liberation from the Germans and the lives saved by the BBC warning.

While the raid succeeded in destroying the factory and limiting civilian deaths, it didn't have much lasting effect. The factory was rebuilt soon after the war and started producing heavy industrial machinery, locomotives and trucks that were shipped throughout the Eastern Bloc. Several Skoda companies, privatized after the fall of the Soviet Union, are still active today, building buses and railroad trains.

Even with the intensity of the flak that day, the Americans lost only six bombers, with 33 crewmen killed and ten captured. Eleven days later, on May 6, 1945, U.S. troops liberated Pilsen. At the Patton Memorial Museum in Pilsen John saw displays of weapons and uniforms, maps and patches, and mannequins dressed as victorious Americans, Czech civilians and surrendering Germans. His breath caught when he saw the ragged-edged piece of wing, about 4 feet wide and 9 feet long. He ran his hand along the metal that had carried his father here from England, the paint long faded, pockmarked with jagged holes where shrapnel punched through the skin.

A photograph of William Hesley, likely taken after he graduated from navigation school, and the telegram to his wife, sent three months after his death.

“That was when it was real,” he says. “It moved it from being a story I had always heard about. Here was the evidence that it really happened.”

Out at the crash site the next day, where little pieces of wreckage still littered the ground, one of the re-enactors picked up a piece of metal that had been melted into a wad the size of a softball. He handed it to John. "It should stay here," John said.

“No,” the man said. “You’re the person who should have this.”

John walked alone through the trees and looked out on the fields. He started to reconsider the narrative he'd told himself throughout his life. "I always believed that if he'd lived, my life would have been different and better," he says. "After going over there and talking with the folks, it dawned on me, I don't have any guarantee of that at all. If he'd lived, I don't know who he would have been. I don't know whether he would have come out damaged after getting into that B-17 every morning."

Damaged like his stepfathers. And everyone else who came home from the Good War and suffered. And the widows. The man whose life his father had inadvertently saved by taking his place that day—did he struggle with guilt?

Compared with the tens of thousands of fatherless children, John knows he's been lucky. Even without his father, his life turned out well, with a loving family, good friends and fulfilling work.

“There were all sorts of good people who just got ground up in the tragedy,” he says. “At some point you have to say ‘What happened happened.’ If he hadn’t gone, somebody would have gone. Why is his life more important than somebody else’s? That’s just how things went.”

His sense of loss has faded, replaced with an acceptance of the story told in the scorched piece of *Checkerboard Fort* that sits on his desk. ♦

In May 1945, locals in traditional Czech costumes welcome U.S. soldiers to Pilsen, the city that was home to the Skoda Works factory.

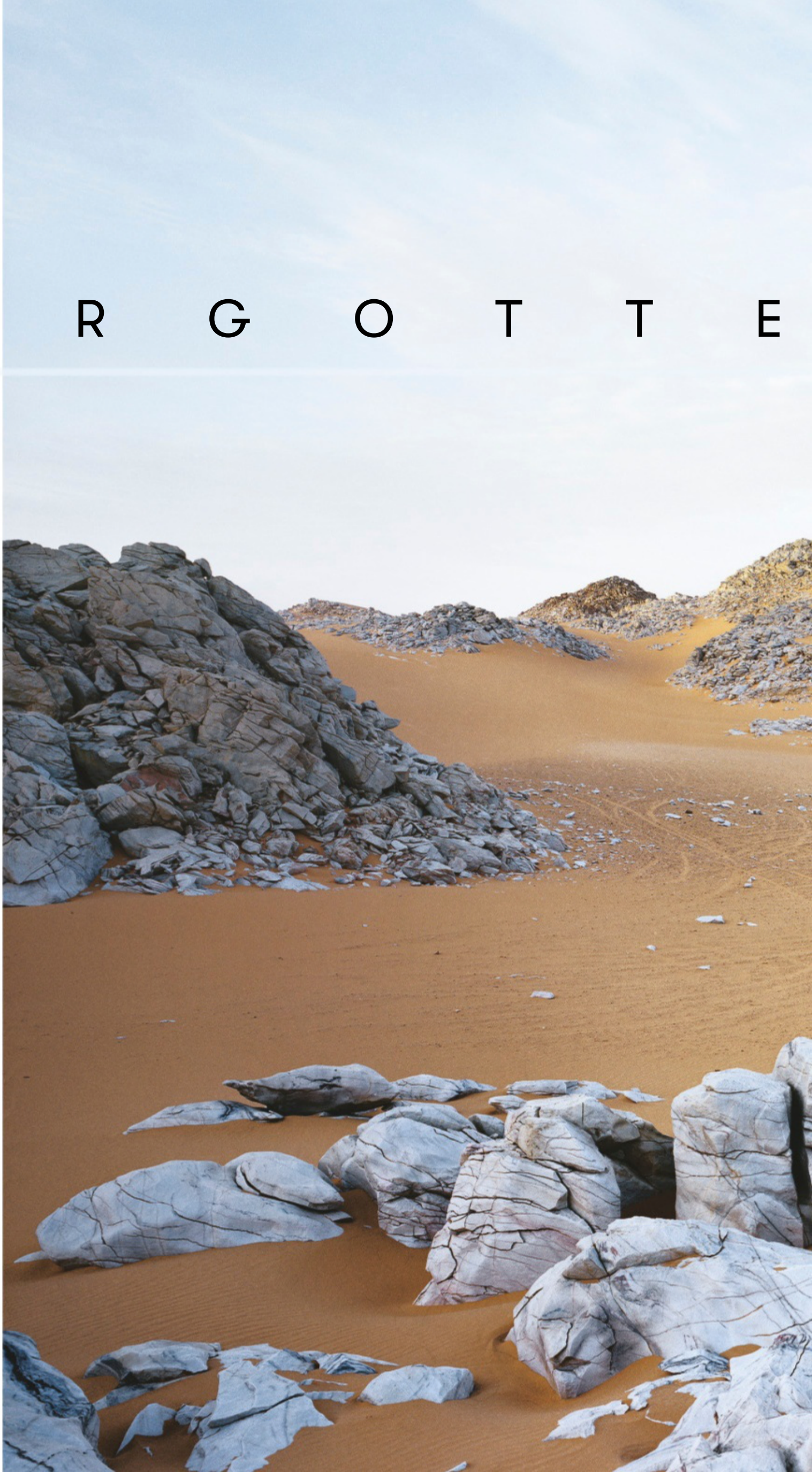


F O R G O T T E N

A photographer
ventures
into remote
northern
Africa for an
unprecedented
view of one
of the world's
most troubled,
and least
understood,
regions

photographs by
Philippe Dudouit

text by
Terence
Monmaney

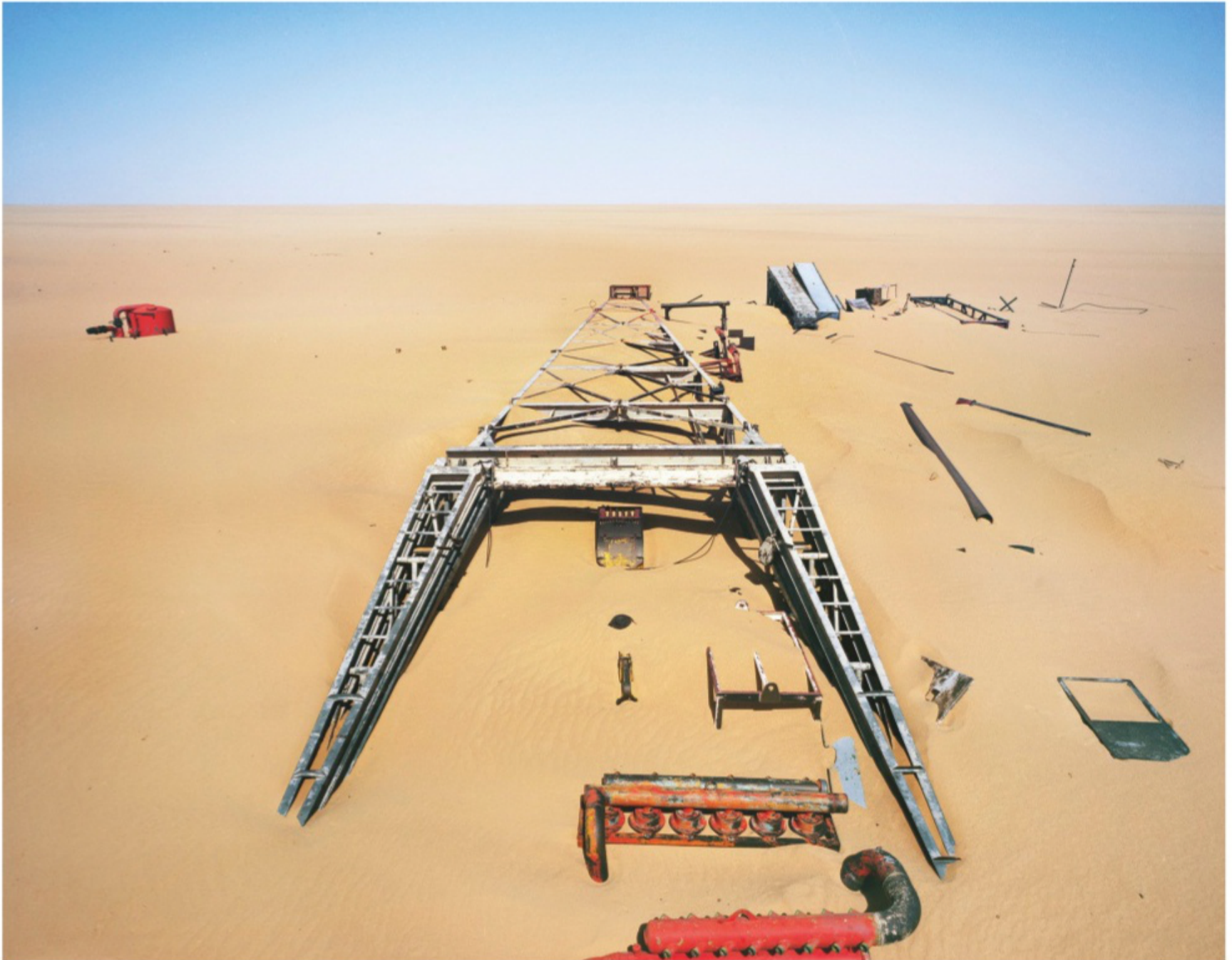


The Blue Mountains
of Niger. Arable land
in the fast-growing
country shrank nearly
50 percent per capita
from 1996 to 2016.

N D E S E R T



In northern Niger, the remains of a 1960s Texaco oil-drilling station. Researchers estimate 30 to 60 percent of the population in seven nations of the Sahel are unemployed—a “pre-scription for social turbulence,” says a U.S. antiterrorism report.



SUN-SCORCHED AND WIND-SCoured, the place that geographers refer to as the Sahara-Sahel stretches across Africa between the desert and the great savanna. Though dozens of tribes and ethnic groups live in the region, which is about the size of the contiguous United States, the estimated population of 135 million is divided among all or part of several nations—Senegal, Algeria, Mali, Mauritania, Burkina Faso, Chad, Niger, Libya. One common thread, aside from the extreme environment, is religion, with the great majority of people practicing Islam. The cultural glories are countless—the petroglyphs of Niger, the music of Chad, the libraries of Timbuktu—but what we in the developed world tend to hear about these days are the problems. It is hot and getting hotter, according to climate scientists, poor and getting poorer, say the economists. Food and water are becoming scarcer while the number of people is rising rapidly. Investment is lagging, services evaporating. Lawlessness, armed conflict and terrorism are on the march.

Clockwise from top left, a commander of the rebel Tuareg group known as the ADC in Mali in 2008. A camel driver in northern Niger in 2008. A view of the Algerian border in 2012 from a watchtower at an abandoned army base in northern Mali, the world’s most dangerous country for U.N. peacekeepers.

Those are generalities, to be sure, but recent official reports from sources as diverse as the U.N., the CIA and academics agree that the people of the Sahara-Sahel face a deepening crisis. This past November, the OASIS Initiative, an international humanitarian group based at Berkeley, California, urged governments and aid groups to help by increasing agriculture, strengthening security and empowering young women, which would curb population growth, among other benefits. The group’s report appears in the scientific journal *Nature*, but





along with the charts and other data treatments are decidedly alarming terms—“powder keg,” “grim,” “living on the edge,” “catastrophe”—intended to pierce the immobilizing complexity of aiding distant societies on the brink.

The emergency is not lost on Philippe Dudouit, a 42-year-old Swiss photojournalist who has lived among diverse groups of people in the rural Sahara-Sahel off and on since 2008. Indeed, he has closely observed the decline himself. To look at the photographs he has created over the past tumultuous de-

cade, many of which are published in the United States this January in his book *The Dynamics of Dust*, is to get a whole new sense of the word “arresting.” These pictures stop you. Sunburned eyes gaze over a scarf worn as a disguise or to keep out the windblown sand, or both. An empty guard tower’s view of endless desert. Long-abandoned oil-drilling equipment. In such stark images you feel the unforgiving nature of the place and the toughness of the people. They are traders, rebels, smugglers and merchants, and without a single explanatory word or statistic you feel they are in a very, very hard situation. And isn’t that the point of documentary art, to let you feel another human being’s predicament? ♦

BYLINES

Philippe Dudouit, who often uses large-format color negative film, has won awards for his photos of Kurdish rebels in northern Iraq and Tuareg rebels in Niger and Mali.



▲
Covering an area larger than Spain and France combined, southern Libya, though far from the war-torn cities of the north, is virtually lawless, fought over by smugglers, Islamists and tribal militias.



▲
In Fassala, Mauritania, a young Arab man who fled violence in Timbuktu. In 2019, anti-government attacks by armed Islamist insurgents and conflicts between ethnic militias displaced more than 200,000 people in Mali.

Once

Upon

a Time

in the

West



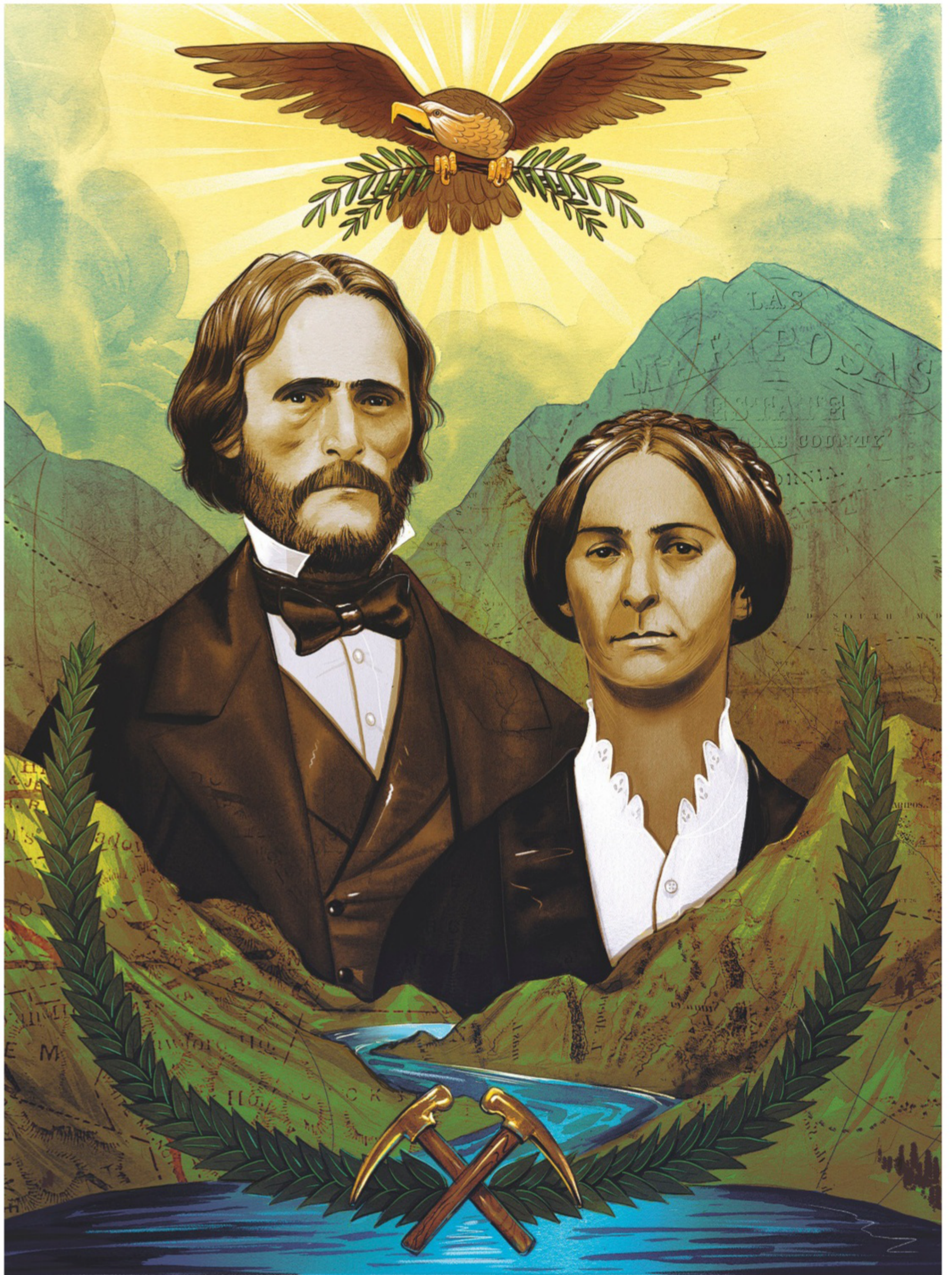
HOW JOHN AND JESSIE
FRÉMONT BLAZED
ACROSS THE AMERICAN
FRONTIER—AND
CHANGED HISTORY

BY

STEVE INSKEEP

ILLUSTRATION BY
ZOË VAN DIJK







F

rom New York, the steamship *Crescent City* carried Jessie Benton Frémont through Caribbean waters toward Panama. It was March 1849. Three hundred and thirty-eight passengers crowded the vessel, most of them would-be gold prospectors and those who hoped to profit from them, bound for California. Only five passengers were female, including Jessie, her 6-year-old daughter, Lily, and their servant. “I had never seen the sea,” Jessie wrote later, and “no one had ever told me of the wonderful new life it could bring . . . that grand solitude, that wide look from horizon to horizon, the sense of space, of freshness.”

When the ship reached Panama, the passengers looked out over woodlands and spied a fort from Spanish times spread across a hilltop to the left. Nearby lay a town, which one passenger described as “two or three hundred



huts made of bamboo poles and covered with the leaves of the palm.” On the water, a little steamboat came into focus, “as small as a craft could well be to hold an engine,” Jessie thought, when her turn came to transfer over the side. “It seemed like stepping down upon a toy.” The boat chugged up the Chagres River, which soon became shallow and rocky, forcing passengers to transfer to smaller boats, mostly dugout canoes paddled by local crews.

Swarms of Americans were making their way up the river that spring. Sleeping in barns or on the bamboo floors of houses, crowds of men woke each morning and spread through the river valley, paying high prices for coffee and eggs, which they supplemented by hunting in the woods. “The scenery is delightful—the most beautiful I ever saw,” one traveler wrote home, describing how he and his companions shot birds that resembled wild turkeys, lizards on the riverbanks, and even a monkey. “The woods are alive



Frémont’s 1842 climb of “the loftiest peak of the Rocky Mountains” was widely commemorated. In truth, more than 100 peaks in the Rockies are higher.



with parrots, chattering away like so many demons.”

Jessie enjoyed a more comfortable journey, because people in Panama had instructions to care for her. The daughter of the powerful Missouri senator Thomas Hart Benton, she was on her way to California to meet her husband, the famous explorer John C. Frémont, where they planned to start a new life. Among her guardians were American engineers conducting surveys for a railroad across the narrow isthmus. One investor, William Aspinwall, intended to connect the railroad with his new steamship line, the Pacific Mail Steamship Company, which was starting service from Panama up the coast to California. In Washington, Aspinwall had obtained a contract to carry United States mail to the West Coast; naturally the man with the federal contract was pleased to look after the daughter of an influential senator, “with all the sympathies of his kind nature,” as Jessie put it, and he made arrangements for “my comfort and security.”



© LOOK AND LEARN / BRIDGEMAN IMAGES

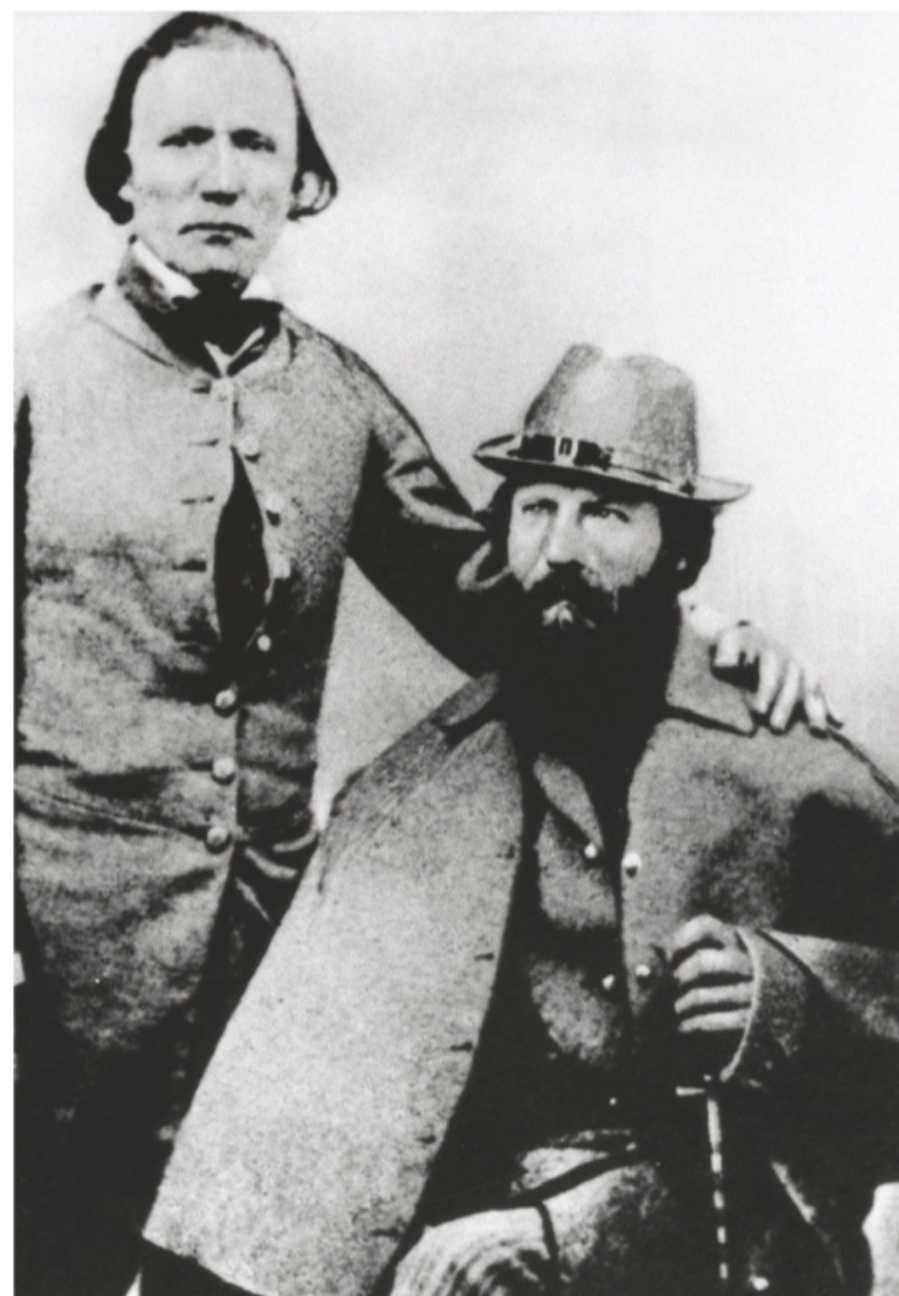
Rather than a dugout canoe, Jessie's party boarded a whaleboat, larger and steadier on the water. Coming ashore each evening, she slept in an oversize tent prepared by the surveyors. U.S. Army officers were part of the survey, and at each campsite she would find one or two waiting "to see that everything was right, and to have the pleasure of home talk with a lady." The Chagres was nevertheless a miserable river for travel. The whaleboat was repeatedly stuck on sandbars. In the town of Gorgona, Jessie began to notice something wrong. "There were hundreds of people camped out on the hill-slopes," said Jessie—in effect, the back of a line that stretched more than 20 miles to Panama City, on the coast, where crowds of travelers awaited boats to California. "There were many women, some with babies, among these; they were in a hot, unhealthy climate, and the uncertainty of everything was making them ill: loss of hope brings loss of strength: they were living on salt provisions brought from home with them, which were not fit for such a climate, and already many had died."

Eventually the engineers arranged mules for Jessie's party, and they joined a line that wound through tropical forest and over a low chain of mountains. The path was barely the width of one mule. They passed through a rock cut so narrow that men had to ride sidesaddle as Jessie did. Jessie was praised for her fortitude by one of the men from the railroad survey, though she felt that she was deceiving him: "The whole thing was so like a nightmare that one took it as a bad dream—in helpless silence."

At the old walled city of Panama, cannons jutted out from the tops of the walls, and the ocean glittered beyond. Pacific Mail steamers were supposed to depart regularly between Panama City and San Francisco Bay, but there was a gap in service. A steamship that had departed for California weeks ago had not returned; another ship that was expected to begin plying the route had yet to make an appearance at all. Any other ships that could be chartered had long since sailed away filled with would-be gold prospectors. Stranded Americans were crowding into hotels or camping.

In the city square, Jessie found a particular house, knocked, and presented a letter of introduction that she had obtained back in Washington; a Latin American diplomat had written it to his aunt in Panama City, and she took in Jessie and Lily, assigning them to a room with a balcony overlooking the square. Jessie was so charmed by the view that she wrote a poetic description—although, not for the first time, she submerged her own voice beneath that of someone else. Lily wanted to write her grandfather, Senator Benton, so on April 27 Jessie took dictation of what

Frémont, right, with Kit Carson, circa 1845, the legendary frontier guide who is also remembered for brutal campaigns against Native Americans.



Lily said, performing a tiny masterpiece of ghost-writing that preserved the cadence and imperfect grammar of a 6-year-old.

From here I see the jail and the government house and the water carts and the little Indians flocking about I see horses coming along with water. I saw a plenty processions [Catholic funeral processions] and one the man that led it was dressed all in gold cloth that shined like the sun; we saw the prisoners marching with dirt on their shoulders and chains around their waists and one of the guard masters with a gun on his shoulder to make them march about.

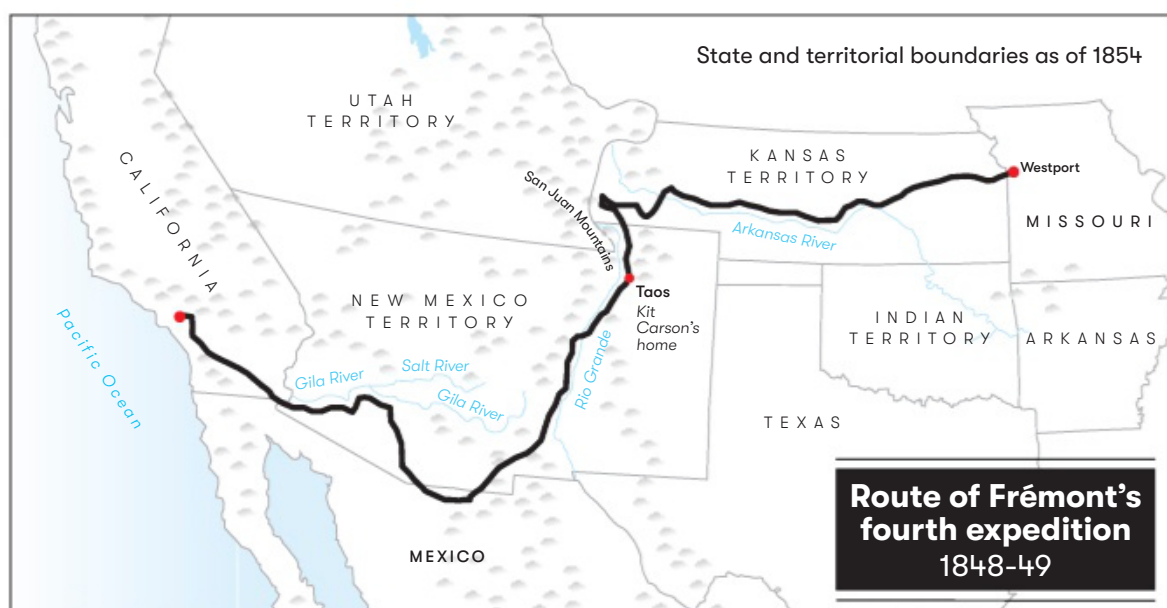
The stranded Americans formed a community, organizing a committee to guard against crime, as well as Protestant church services, and did what they could to make money. "There are American water-carriers, porters, boatmen, builders of canoes," said one traveler. "There are auctions held hourly, when trunks, tents, camp stools, watches, preserved meats and even gold washers, are knocked down by the inevitable hammer."

BYLINES

Steve Inskeep is the cohost of NPR's "Morning Edition" and the podcast "Up First."

Zoë van Dijk is an editorial illustrator working and creating out of Los Angeles.





During his own life, John Charles Frémont was among the most famous men of his time. Born out of wedlock to a Virginia woman and a French immigrant, he rose from obscurity in 1842, when he commanded the first of several major expeditions exploring the West. After traveling for months at a time on horseback and foot, often through deep snow, he returned home to Washington, D.C. to write Army reports about his adventures—stories told so evocatively that they were excerpted in newspapers and published as popular books.

In 1845, he crossed the Sierra Nevada mountains to reach the Pacific coast near San Francisco Bay, where he and his 60 armed men helped to trigger the United States' conquest of the Mexican territory of California. He was not even 40 years old when Americans began naming mountains and towns after him. One journalist called him "the Columbus of our central wildernesses." Europeans followed each step of his adventures: 350,000 people attended a long-running stage show in London that featured paintings of his experiences. John C. Frémont was a phenomenon of a kind we associate with modern celebrity culture.

What brought him such acclaim? Genuine accomplishment, in part. The conquest of California was one of the most consequential acts in United States history. His detailed reports pointed emigrants to Oregon and helped inspire Mor-

Mailbags were arriving from New York, sealed and marked for delivery to San Francisco; realizing that many of the letters must be intended for them, the Americans elected another committee to open the bags and look. Newcomers from the East also brought newspapers, which passed from hand to hand. It is likely that in some of these newspapers, Jessie spied her name. Papers across the nation had picked up the story of the bold travels of "Mrs. Frémont." But any pleasure she may have felt at her growing fame was destroyed when she began to learn the fate of her husband.

On the sofa of her room in Panama City, she clutched an old *New York Herald*. One headline read:

DREADFUL INTELLIGENCE FROM THE ROCKY MOUNTAINS—
Horrible Sufferings of Colonel Fremont's Party.

HIS DETAILED REPORTS POINTED EMIGRANTS TO OREGON AND HELPED INSPIRE MORMONS TO SETTLE NEAR THE GREAT SALT LAKE.

TODAY THE FRÉMONT NAME is imprinted on the American landscape like the crater of some ancient meteor strike, its outlines apparent though eroded and overgrown. A Tesla car factory is located in Fremont, California. In Las Vegas, vacationers gamble inside a mall called the Fremont Street Experience. Residents of Seattle live in the Fremont neighborhood, named by emigrants from Fremont, Nebraska, which shares its name with Fremont, Ohio, New York and New Hampshire. Hikers scramble up Fremont Peak in Wyoming, elevation 13,743 feet, and the smaller Fremont Peak outside Monterey, California. Readers of the more than 15,000 books on Abraham Lincoln often discover both John and Jessie Frémont, who quarreled with the president in the 1860s. ("You are quite a female politician," President Lincoln told Jessie when she lobbied him on behalf of her husband.) Yet for all the ways that they remain in plain sight, the Frémonts have largely faded from our national consciousness.

mons to settle near the Great Salt Lake. His maps of the West, drawn using cutting-edge devices that could measure the angle of the sun and, at night, the North Star, which helped to determine longitude and latitude, as well as measure barometric pressure, indicating altitude, were more reliable than earlier charts because he insisted on mapping only landmarks he had seen himself. He collected so many specimens of previously unrecorded plants that botanists named many after him, and when he reached San Francisco Bay, he gave the harbor mouth its name: the Golden Gate. When, in 1856, the newly formed Republican Party, established to oppose the expansion of slavery, ran its first candidate for president, it nominated John Frémont.

But the most important factor in Frémont's fame may have been the person who made it possible: Jessie Benton Frémont, his wife. The daughter of a senator who was deeply involved in the West, she provided her previously unknown

husband with entree to the highest levels of government and media. It was no coincidence that his career began to soar a few months after they eloped, in 1841, when he was 28 and she was 17. Jessie amplified his talent for self-promotion, working with news editors to publicize his journeys. She became his political adviser. She attracted talented young men to his circle, promoted friends and lashed out at enemies. At a time when women were allowed to make few choices for themselves, she carried on conversations with senators twice her age, offered her opinions to presidents even when they did not agree with her, and was gradually recognized as a political force in her own right.

Unbeknownst to most of the Americans who revered John, Jessie also helped to write his famous reports and some of his letters, serving as his secretary, editor, writing partner and occasional ghostwriter. In a letter from 1846, written while John was away on his third expedition, Jessie told her husband about how the public was enamored of a masterpiece of narrative they had written together about his previous expeditions. "Its popularity has astonished even me, your most confirmed & oldest worshipper."



Frémont's presidential campaign literature frequently featured Jessie, who the politician Elisha Crosby quipped was "the better man of the two."

An illustration of Frémont's men trapped in the San Juan Mountains. News accounts of the expedition captivated the nation—and worried Jessie.



When John next returned to Washington, she said, "I am not going to let you write anything but your name when you get home."

JOHN RETURNED TO WASHINGTON in the fall of 1847—under arrest, and facing a court-martial, after having disobeyed the orders of a superior Army officer during the war in California. In January 1848, John was convicted, and kicked out of the Army. In a letter dated February 16, President James K. Polk affirmed the sentence, but added that "in consideration of . . . previous meritorious and valuable services of Lieutenant Colonel Frémont," he should "accordingly be released from arrest, will resume his sword, and report for duty." But because Polk had not overturned the verdict of the court-martial, John found the clemency intolerable, and he resigned his position.

John wanted out of Washington to make a new life in California; Jessie wanted to go with him. But how would they get there, and what would they do for a living? After Senator Benton tried, and failed, to appropriate federal funds for an expedition to find a route for a railroad from St. Louis to San Francisco, he and John secured private money and equipment instead.

On this basis John departed for the fourth major expedition he had led in the West, and the first that he conducted without the support of his government. Jessie, who would meet him in California once his expedition was complete, was nevertheless determined to accompany him as far as she could to see him off, bringing the family along—now including a son, Benton, who was born in July. The family took a roundabout route, using new rail and steamboat networks: up the coast to New York, then up the Hudson River to Albany. From there, trains took them to Buffalo, on the shore of Lake Erie. John was dispirited. On a steamboat carrying them across Lake Erie to Ohio, they fell into conversation with a traveler named T. C. Peters, who felt that John needed Jessie's "comforting presence. There had been no time in his whole career, when his prospects looked as gloomy as then." The Frémonts said they wanted nothing more in life than "to entertain their friends in their own house." After almost seven years of marriage they had yet to call any house their own.

From Ohio, the expanding rail network now led nearly to St. Louis, where the group moved into Senator Benton's house as John filled out his roster of men. On October 3 the men boarded a steamboat, which shoved off beneath a cloud of smoke and turned westward up the Missouri River. Six-year-old Lily stayed behind in St. Louis; baby Benton, not 2 months



old, came along with his mother toward the frontier, where they would see off John's expedition.

They made the newspaper when the boat stopped in the riverside village of Jefferson City, Missouri.

Lieut. Col. Fremont and 35 of his men, passed up the river on board the steamer Martha last Thursday, on their way to California. Col. Fremont's lady accompanies him as far as Westport.

The newspaper missed the news. For it was around Jefferson City that baby Benton grew ill, and on October 6, 1848, as the steamboat churned the brown waters, he died. For the first time Jessie was on intimate terms with death. "Grief was new to me," she wrote in a letter, "and I could not bear to give him up."

Two days later, on October 8, the steamboat crew tied up at Westport, near where the Kansas River met the Missouri. A glance at the foliage confirmed to John that it was later in the season than for any past expedition. Wisdom suggested waiting to start in the spring; compassion suggested that he spend a season of grief with his wife. But he was in no mood to change course while trying to escape the bitterness of his recent past. He began saying he had planned the late start, because he wanted to prove that the railroad route would be passable through the Rockies in winter. The expedition broke camp to leave, and Jessie, standing by the ashes of his campfire, watched John swing into the saddle and ride off with his men.

Jessie returned with Lily to Washington late that fall. In March, they traveled to New York, staying a few days at a hotel with a bookstore selling a 25-cent edition of *Fremont's Exploring Expedition*. On March 15, 1849, they boarded the steamship *Crescent City* for Panama, where they would cross the narrow country to catch a California-bound ship on the Pacific coast.

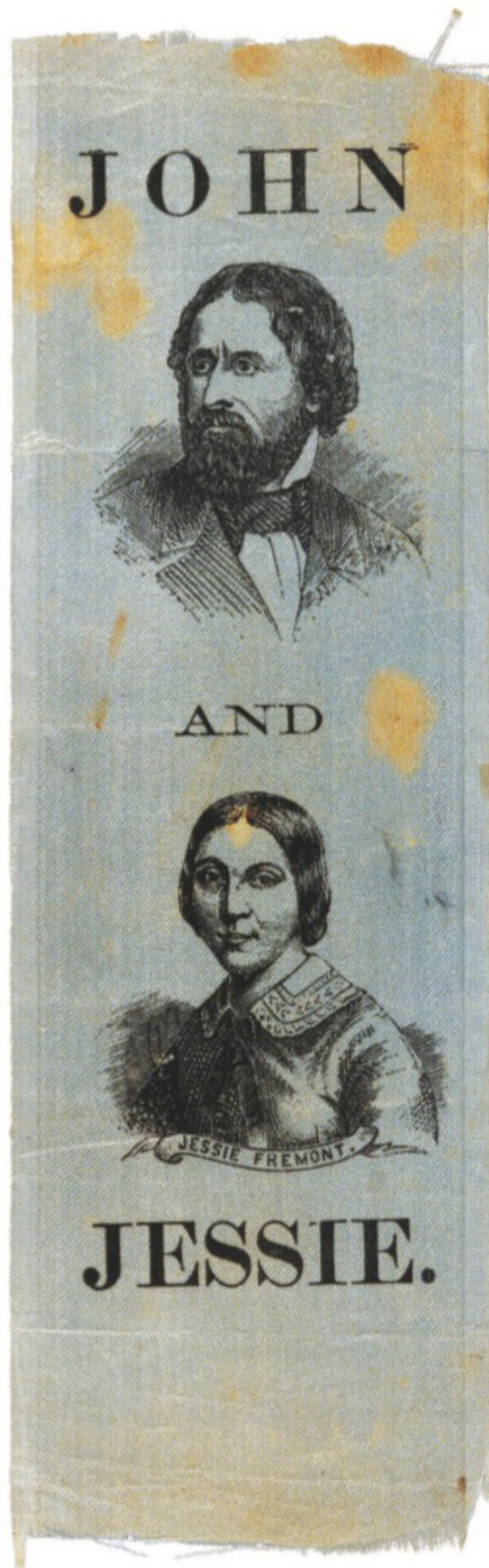
THE LAST LETTER Jessie had received from John, before embarking for Panama, placed him at Bent's Fort, the adobe-walled trading post just east of the Rockies. John stopped there in November 1848, a few weeks after leaving Jessie in Westport,

to buy extra mules and supplies. The expedition had encountered snow on the prairie and ice when fording the Arkansas River, John wrote, and men at Bent's Fort affirmed that winter was arriving early. Now, stuck in Panama City, Jessie read accounts of what had happened to his party in the months since.

John hadn't stayed long at Bent's Fort. He pushed westward to Pueblo, in the future state of Colorado, facing the snowcapped Rockies. Here he asked around for a guide, because he was not aiming for well-known passes. He meant to move directly westward, through territory much less familiar. The man who took up the challenge was William Williams, known as Old Bill Williams. John knew him; he had worked for the previous expedition when it passed through this region in 1845. Williams was "a man about six feet one inch in height," according to one description, "gaunt, red-headed, with a hard, weather-beaten face, marked deeply with the small pox." He was an eccentric horseman, who rode with the stirrups so short that his knees nearly touched his chest. But he said he knew passes in the direction John wanted to go, and agreed to try for them even though he expressed doubt about the wisdom of a winter crossing.

As a young man, Williams had lived in western Missouri as a missionary to Indians, but lost interest in converting them and went to live among them. He married an Osage woman, learned the language, and worked for federal Indian authorities as an interpreter and messenger. Sometimes he delivered documents to William Clark, the explorer turned Indian superintendent, and he assisted when Clark persuaded the Osage to sell their land and leave Missouri. Later Williams worked as a fur trapper, ranging as far as California and Canada. He kept on for decades, spending months at a time in the mountains before descending into Taos, New Mexico, to cash in his pelts

and spend his profits on a drunken spree. He was 62 when he agreed to guide John's men, starting by crossing the Sangre de Cristo (Blood of Christ) Mountains, which they reached on November 26, 1848. The party now numbered 33. They had more than a hundred mules, though the men started out on foot to spare the animals, which were loaded with corn so they could be fed when the grass was covered with snow.



Each day the journey grew more difficult, and they had not gone far before John began to lose faith in Bill Williams. “We occupied more than half a month in making the journey of a few days,” John complained, “blundering a tortuous way through deep snow, which already began to choke up the passes, for which we were obliged to waste time in searching.” The loss of time was dangerous, damaging the men’s morale and using the mules’ rapidly dwindling supply of corn. John thought Williams must have “entirely forgotten” the mountains they were crossing, while the mapmaker Charles Preuss wrote a summary judgment in his diary: “It was obvious that Bill had never been here.”

At last they descended to the broad valley of the Rio Grande, which led in a westerly direction. But they found the valley covered in powder too deep for the mules to get at grass, and the animals had eaten nearly all their corn supply, so they climbed westward into the San Juan Mountains. John considered this terrain to be “the most rugged, and impracticable of all the Rocky Mountain ranges, inaccessible to trappers and hunters even in the summertime.” If this was so, why was he attempting to cross these mountains in winter, and why would he imagine that railroad tracks could run through them? A railroad required a pass with a slope gradual enough for locomotives pulling heavy loads; John seemed to have lost sight of his purpose. “We pressed onward with fatal resolution,” he confessed. The men in the lead beat down the snow with mauls so that it might hold the weight of those who followed.

“Nothing was visible at times through the thick driving snow,” recalled one of the men, Micajah McGehee. “For days in succession we would labor to beat a trail a few hundred yards in length, but the next day the storm would leave no trace of the previous day’s work.” Men suffered frostbite in their “noses, ears, faces, fingers, and feet.” At night, starving mules ate the blankets off the backs of other mules, or wandered into camp and tried to eat the blankets off the sleeping men.

Having forgotten about finding a pass that was gradual enough for a railroad, John seemed even to forget about finding a pass suitable for men. He led them toward a final, bare summit ridge high above the tree line. If they could cross this ridge, he believed, they would find a downhill path to the west and south. On their first try they were beaten back by a snowstorm. “Old Bill Williams,” said McGehee, “was nearly frozen; he dropped down upon his mule in a stupor and was nearly senseless when we got into camp.” On a second try they crested the ridge, descended the far slope to the first stand of timber,

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A 19th-century woodcut of the port of Chagres, in Panama, where American steamships deposited passengers, including Jessie Frémont, bound for California.

and gathered wood for their fires at an altitude of about 12,000 feet. John looked back up their trail, which resembled the path of a defeated army: “pack saddles and packs, scattered articles of clothing, and dead mules strewn along.” When he studied the vista westward he saw nothing but snow and more mountains. At last John acknowledged his situation: “It was impossible to advance, and to turn back was equally impracticable. We were overtaken by sudden and inevitable ruin.”

San Francisco Bay, where John was to meet his wife and daughter, lay roughly a thousand miles to the west.

JOHN INSTRUCTED HIS MEN to remain a few days in camp. They ate macaroni and cooked the meat of dead mules. John developed a plan of retreat. First the men would lug their equipment back over the windy summit they had just crossed, returning to the eastern side of the mountain so they could descend to one of the streams that fed the Rio Grande.

The river would be their highway to safety, he thought, but once the men began to move they found





would slowly shift their baggage down to the main channel of the Rio Grande and wait there, tending fires to stay alive and rationing the food that remained. John had a simpler option available: abandoning most of the equipment and marching everyone to safety while they still had some food left. But leaving the equipment would mean ending the expedition; he thought he could resume on a new route once fresh supplies came up.

At quiet moments in a tent or wrapped in a blanket near a fire, John reached into a bag and fished out a set of books: William Blackstone's *Commentaries on the Laws of England*. He had borrowed them from Senator Benton's library in Washington, dense and demanding volumes commonly read by aspiring lawyers. The Illinois lawmaker Abraham Lincoln had read them twice and later kept them in his cluttered law office; now John was reading them in his shelter in the ever-deepening snow. He was thinking of a career mixing law and politics, still focused on his California future amid the increasing pain of hunger and cold.

Around January 8 John concluded that they could wait no longer for relief. He formed a second party to go for help and led it himself, bringing along four others: the mapmaker Charles Preuss, his best man Godey, Godey's nephew, and Jackson Saunders, a black man who had been a servant in the Benton household and now served as John's orderly. Their journey

“THE DESTRUCTION OF MY PARTY, AND THE LOSS OF FRIENDS, ARE CAUSES OF GRIEF; BUT I HAVE NOT BEEN INJURED IN BODY OR MIND.”

the labor brutal and demoralizing. “A few days were sufficient to destroy our fine band of mules,” John said. “They generally kept huddled together, and as they froze, one would be seen to tumble down, and the snow would cover him. . . . The courage of the men failed fast: In fact, I have never seen men so discouraged by misfortune.” A handful refused to quit, above all John's trusted companion Alex Godey, a Frenchman who had first gone with John to California and then to the court-martial and was with him still.

By Christmas Day they were on a tributary of the Rio Grande, and John sent four volunteers ahead in search of aid. He assigned Old Bill Williams to guide the group. The remaining men, including John,

was bleak. They built a fire each evening and ate the last of their meat and macaroni. After that they had nothing but coffee. On the fifth day they surprised an Indian man, a member of the Utah Nation who was walking on the ice of the river. The man agreed to lead them to his house some miles away, and when they reached it the following morning they sat down to eat what Preuss called “a magnificent breakfast of corn mush and venison, together with our coffee.”

In exchange for a rifle and John's own two blankets, the Utah man agreed to guide them onward. They had not walked far before they discovered three men huddled around a fire: the remnants of the party John had sent for relief. Exhausted and

starving, they seemed to have “entirely lost sight of the purpose of their expedition,” as Preuss put it. They focused only on finding food while walking short distances each day. They had boiled and eaten straps, gun cases, and anything else made of leather. One had died. When discovered, the survivors were gnawing the meat of a deer they had killed, having spent 22 days walking the distance that John’s party had just covered in six. Gathering up the three men, John’s group staggered into a little town. When they learned that the settlement could not offer enough animals to relieve the men still stranded upriver, heroic Alex Godey rode downriver to the next town and returned with a string of mules.

Eager to continue to California—John seemed never to consider turning back east—he focused on reorganizing his expedition and left the rescue to Godey, who enlisted a handful of Mexican residents and soldiers from a nearby Army post and worked upriver to discover the remaining men of the expedition in small groups—walking, huddled by fires, or dead. In all, 11 had died, one-third of those who had

a cup of chocolate was brought to me while yet in bed. To an overworn, overworked, much-fatigued and starving traveller these little luxuries of the world offer an interest which in your comfortable home it is not possible for you to conceive.

He told her all that had gone wrong, though he blamed it all on Old Bill Williams. He said he still expected to proceed west, regrouping the men who were willing and able to continue, and starting for California by a southerly route, along old Spanish trails.

. . . How rapid are the changes of life! A few days ago, and I was struggling through the snow. . . . Now I am seated by a comfortable fire, alone—pursuing my own thoughts—writing to you in the certainty of reaching you—a French volume of Balzac on the table—a colored print of the landing of Columbus on the wall before me—listening in safety to the raging storm without!

AS THE NEWS OF JOHN’S PREDICAMENT SPREAD IN PANAMA CITY, “FRIENDS AND STRANGERS BOTH ROSE TO PROTEST AGAINST MY GOING ANY FARTHER.”

ridden into the mountains at the end of November. One of the survivors, Andrew Cathcart, described himself as “a perfect skeleton, snowblind, frostbitten and hardly able to stand.”

John decided that the survivors should continue down the Rio Grande to recover at Taos, New Mexico. He led the way there, riding by the end of January into the old Spanish colonial settlement overlooked by snowcapped mountains. Until recently the town had been part of Mexico; now there was a United States Army post, where the commander ordered rations distributed to John’s men. Near the Army post John found the home of his friend Kit Carson, the legendary fur trapper and frontier guide: a low adobe structure where Carson lived with his third wife, who was Mexican, as well as several children. It was here, with a family, that John rested and began to compose a letter to his wife.

*Taos, New Mexico, January 27, 1849
I write you from the house of our
good friend Carson. This morning*

An 1887 first edition of Frémont’s memoirs, which Jessie helped him complete. Curiously, the narrative ended in 1847, and left out decades of his life.

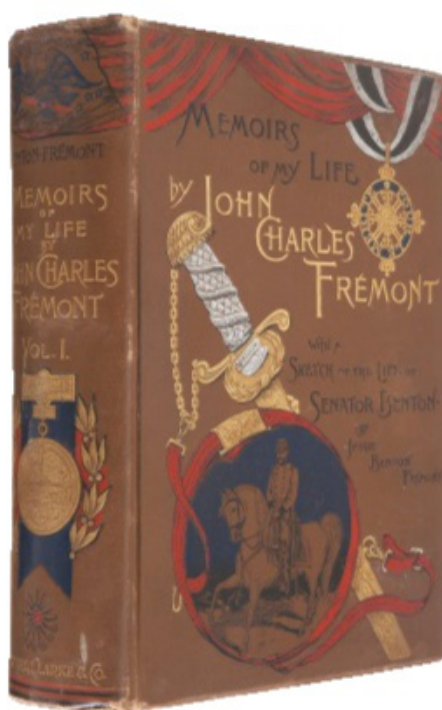


He insisted the mental stress of his experience had no effect on him. “The destruction of my party, and the loss of friends, are causes of grief; but I have not been injured in body or mind. Both have been strained, and severely taxed, but neither hurt.”

Over the next few days he reorganized as quickly as possible, preparing to leave town so swiftly that some of the men who dropped out of the expedition

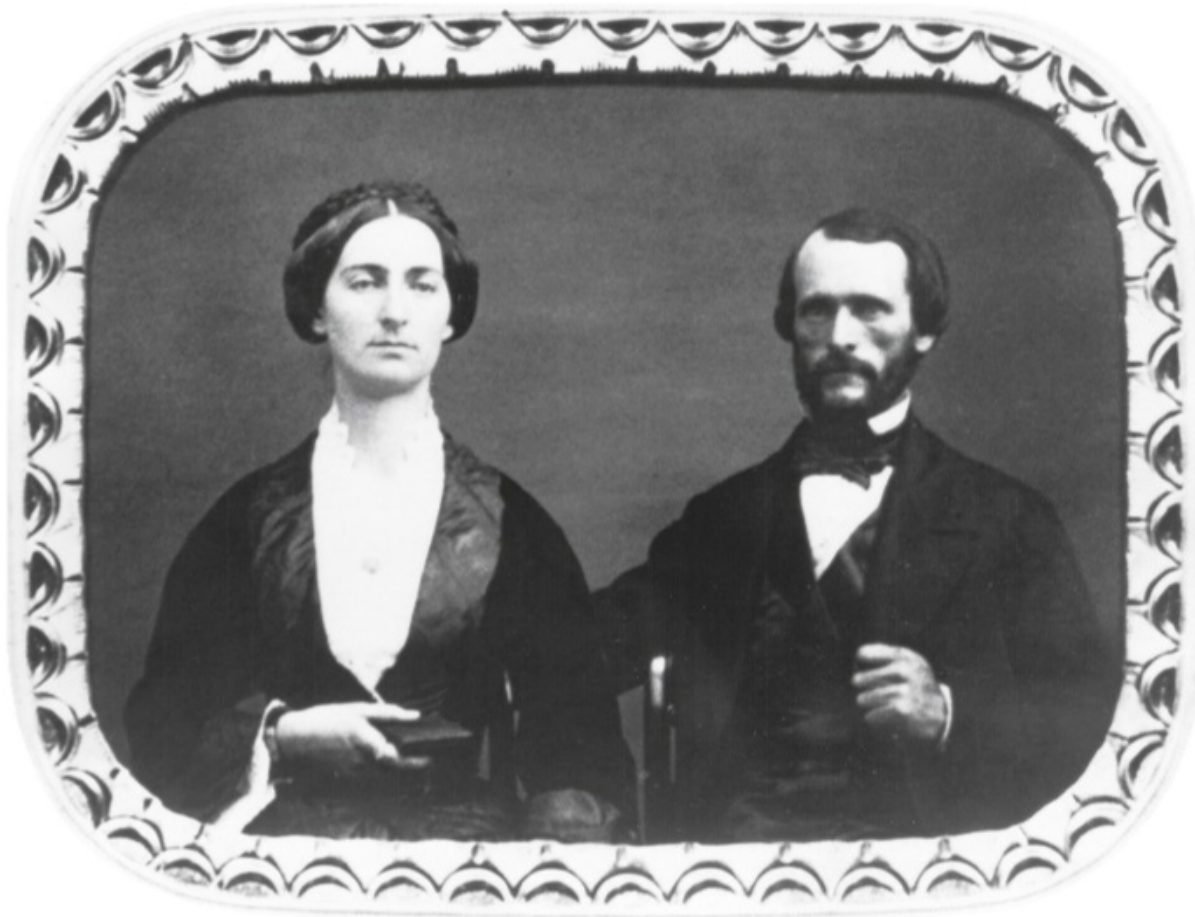
felt abandoned. That John was determined to reach the Pacific there could be no doubt; his search for a rail route had failed, but he meant to meet Jessie at their new home.

JESSIE READ JOHN’S LETTER three months later, in May, 3,600 miles away in Panama City. Near the end she saw this sentence: “It will not be necessary to tell you anything further. It has been sufficient pain for you to read what I have already written.” That was wrong. Jessie wanted to know one more thing that she had no chance of knowing: What had become of her husband in the months since his letter, when he set out



across the Southwestern mountains and deserts?

As the news of John's predicament spread among the other travelers stranded in Panama City, "friends and strangers both rose to protest against my going any farther," Jessie wrote. Even if she and Lily made it safely to California, it was reasonable to fear that



John would not be there to meet them. Jessie spent an entire day sitting on a sofa in her host's house by the square, "my forehead purple from congestion of the brain, and entirely unable to understand anything said to me."

After a few days she felt well enough to walk out to the ramparts of the old walled city. Stranded Americans strolled atop the walls during the cool hour before sunset. "They were an eager, animated set of people when first there, but the failure of the steamers to arrive had told upon every one. They felt, like shipwrecked people, that there was no escape." Many had run short of money, caught tropical fevers, or buried members of their parties who fell ill and died. It was the frustrated, sick and idle who caught Jessie's eye as she sat on the barrel of an old brass cannon. "The sight of this discouraged set of people almost decided me to go home," she said.

Still, Jessie persisted until one evening a cannon shot rang out from the harbor, followed by a second: the signal that two ships were arriving. One, called the *Oregon*, had returned from San Francisco Bay; the other, the *Panama*, had arrived to work the San Francisco route for the Pacific Mail Steamship Company, having come from New York. The moonlit square in

Although they spent long stretches apart, Jessie and John Frémont, seen here in an undated photograph, had been married nearly 50 years when John died in 1890.



front of Jessie's house filled with disembarking passengers. "Of course I was up, dressed, and looking at all this busy throng," Jessie said, when she heard a man call out her name: "Mrs. Frémont here! Heavens, what a crib for a lady!"

The man in the crowd was Jessie's friend Edward

F. Beale, a naval officer who had first brought the news of California gold to Washington. She drew the bearded man away from the raucous mass so they could talk. After delivering the news of the gold strike, Beale had accepted an assignment to return to California with dispatches in the fall of 1848; Jessie knew this much. But now, after less than two weeks in California, he was rushing back eastward. Only in an excited whisper would he have said what he was carrying: a gold nugget that weighed eight pounds, which he expected to show off to investors in New York. When he learned of John's misfortunes, Jessie recounted, "I was not advised but ordered to go home." Beale insisted that she gather up Lily and her baggage; he would

escort her. Just as firmly, Jessie refused. She bade Beale goodbye, then made sure she had tickets for herself and for Lily on one of the steamers bound for California.

The Pacific Mail steamship *Panama* raised anchor carrying more than 300 passengers on a vessel built with berths for something closer to 200. Extra passengers spread blankets on deck around the funnel, beneath the ship's three masts. The few women were allowed some separation from the mass of men; Jessie received one of the staterooms belowdecks. But within a few days, she developed a cough so severe that a man in the next cabin heard her through the wall. Blaming the dank air inside the coal-fired ship, he led her up on deck and helped arrange for her to spend most of her time on the quarterdeck, the raised area typically occupied by officers. The crew draped an oversize flag over a boom to form a tent, which soon became a refuge for all the females on board. Below, a pastor stood on the rocking deck and continued the Protestant Sunday services that had begun in Panama City.

Jessie passed her birthday on the Pacific on May 31, 1849, with the mountains of California somewhere off to her right. She

CONTINUED ON PAGE 118

First Americans

CONTINUED FROM PAGE 41

movement could account for the growing number of archaeological sites dating from 14,000 to 15,000 years ago in Oregon, Wisconsin, Texas and Florida. Far to the south, at Monte Verde in southern Chile, conclusive evidence of human settlement dates back at least 14,500 years.

“I think it has become more and more clear, based on the genetic evidence, that people were capable of much more in terms of spreading out than we thought,” says Willerslev. “Humans are very early on capable of making incredible journeys, of [doing] things that we, even with modern equipment, would find very difficult to achieve.”

In Willerslev’s view, what primarily drove these ancient people was not the exhaustion of local resources—the virgin continents were too rich in food and the numbers of people too small—but an innate human yearning to explore. “I mean, in a few hundred years they are taking off across the entire continent and spreading into different habitats,” he says. “It’s obviously driven by something other than just resources. And I think the most obvious thing is curiosity.”



SOME ARCHAEOLOGISTS, like Ben A. Potter at the University of Alaska Fairbanks, emphasize that genetics can only provide a road map for new digs, not solid evidence of the Beringian Standstill theory or the settlement of the Americas 20,000 years ago. “Until there’s actual evidence that people were in fact there, then it remains just an interesting hypothesis,”

A Quadra Island cove. Research now shows that early Americans thrived in this environment.



he says. “All that is required is that [ancestral Native Americans] were genetically isolated from wherever the East Asians happened to be around that time. There’s absolutely nothing in the genetics that necessitates the Standstill had to be in Beringia. We don’t have evidence that people were in Beringia and Alaska then. But we do have evidence that they were around Lake Baikal and into the Russian Far East.”

After Potter unearthed the 11,500-year-old remains of two infants and a girl at the Upward Sun River site in Alaska’s Tanana Valley—among the oldest human remains found in North America—Willerslev sequenced the infants’ DNA. The two scientists were co-authors on a *Nature* paper that “support[ed] a long-term genetic structure in ancestral Native Americans, consistent with the Beringian ‘standstill model.’”

But Potter thinks that news stories on these and other findings have been too definitive. “One of the

Finding Ways



THE CLUES ARE TANTALIZING. BUT PROVING EXACTLY HOW HUMANS FIRST REACHED THE AMERICAS IS CHALLENGING

A S SCIENTISTS DEBATE the peopling of the Americas, it’s worth noting there could be more than one right answer. “I think current evidence indicates multiple migrations, multiple routes, multiple time periods,” says Torben Rick, an anthropologist at Smithsonian’s National Museum of Natural History.

Rick began his own career studying a likely migration along the “Kelp Highway”—the rim of coastline that apparently once stretched from Asia all the way around to North America.

“People could basically stair-step their way around the coast and have a similar suite of resources that they were in general familiar with,” says Rick, who has spent years excavating sites on the California coast.

Rick’s late Smithsonian colleague Dennis Stanford famously advocated the Solutrean hypothesis, which claims the first Americans came over from Europe, crossing the ice of the North Atlantic. Rick isn’t sold on the idea, but he praises Stanford’s willingness to explore an unusual notion: “If we don’t look and we don’t test it and don’t rigorously go after it, we’ll never know for sure.”

Regarding sites in South America that date back more than 14,000 years, could humans have traveled there by boat, perhaps from Oceania? It’s a question researchers have had to consider. But, Rick says, the theory “doesn’t pass the smell test” because it’s unlikely that people then were capable of crossing an open ocean.

Still, he notes that scientists don’t know much about prehistoric watercraft because they were made of perishable materials. “We can say, ‘Ha-ha, that idea doesn’t work’—but I can’t tell you exactly why those early sites are there,” he admits. “Human ingenuity is incredible. I would never underestimate it.” —JENNIE ROTHENBERG GRITZ

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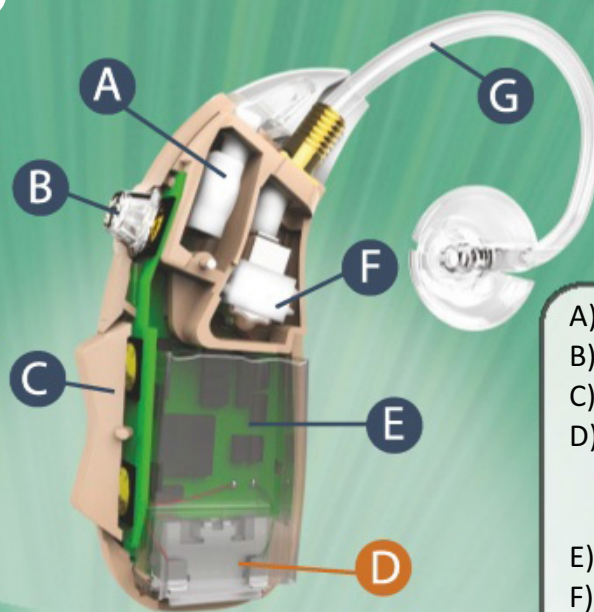
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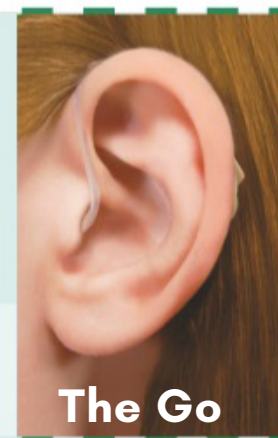
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problems with the media coverage is its focus on a single hypothesis—a pre-16,000-year-old migration along the northwest coast—that is not well supported with evidence.”

Potter remains doubtful that humans could have survived in most of Beringia during the bitter peak of the ice age, about 25,000 years ago. “Across the board,” he says, “from Europe all the way to the Bering Strait, this far north area is depopulated. There’s nobody there, and that lasts for a long time.”

But some scientists retort that the reason no sites older than 15,000 to 16,000 years have been discovered in easternmost Siberia or Alaska is that this sprawling, lightly populated region has seen little archaeological activity. The area now defined as Beringia is a vast territory that includes the present-day Bering Strait and stretches nearly 3,000 miles from the Verkhoyansk Mountains in eastern Siberia to the Mackenzie River in western Canada. Many archaeological sites at the heart of ancient

“It means nothing to say that no sites have been found between Yana and Swan Point. Have you looked? This is just a question of research and how good a map you have.”

Beringia are now 150 feet below the surface of the Bering Strait.

Ancient sites are often discovered when road builders, railway construction crews or local residents unearth artifacts or human remains—activities that are rare in regions as remote as Chukotka, in far northeastern Siberia. “It means nothing to say that no sites have been found between Yana and Swan Point,” says Pitulko. “Have you looked? Right now there are no [archaeologists] working from the Indigirka River to the Bering Strait, and that’s more than 2,000 kilometers. These sites must be there, and they are there. This is just a question of research and how good a map you have.”

Hoffecker agrees: “I think it’s naïve to point to the archaeological record for northern Alaska, or for Chukotka, and say, ‘Oh, we don’t have any sites that date to 18,000 years and therefore conclude that nobody was there.’ We know so little about the archaeology of Beringia before 15,000 years ago because it is very remote and undeveloped, and half of it was underwater during the last ice age.”



FIVE FEET DOWN IN A PIT at a wooded grove on Quadra Island, Daryl Fedje is handing up stone tools with the good cheer of someone hauling heirlooms out of grandmother’s trunk in the attic. From the pit, illuminated by powerful lights suspended from ropes strung between trees, Fedje passes the most promising items to his colleague Quentin Mackie, who rinses them in a small plastic container of water nailed to a tree and turns them over in his hand like a jeweler inspecting precious stones.

“Q, have a look at this,” says Fedje.

Examining a dark stone the size of a goose egg, Mackie turns to me and points out the rock’s pitted end, which is where it was used to strike objects in the toolmaking process. “This has got little facets,” says Mackie. “I’m sure it’s a hammerstone. It’s symmetrical, balanced, a good striking tool.”

Mackie drops the hammerstone into a plastic zip-lock bag with a small piece of paper denoting its depth and location in the pit.

Next up is a two-inch-long gray rock with sharp edges, the chipped planes from the fracturing process clearly visible. “I think what we have here,” says Mackie, “is a double-ended graving tool—you can drill with one end and scribe antler with the other.” It, too, is dropped into a zip-lock bag.

And on it goes, hour after hour, with Fedje and his colleagues pulling roughly 100 stone artifacts out of the pit in the course of a day: a sharp tool likely used to cut fish or meat, the bottom half of a small spear point, and numerous stone flakes—the byproducts of the toolmaking process.

Fedje believes that an especially promising area for archaeologists to apply his group’s techniques is the southeastern coast of Alaska and the northern end of the Gulf of Alaska. “At just five feet above current sea level, you could find places that were great for people 16,000 years ago,” he says.

Ted Goebel, associate director of the Center for the Study of the First Americans at Texas A&M University, says that recent developments in genetics, coupled with the work of Fedje and his colleagues, have spurred his desire to search for early Americans in far-flung reaches of Alaska, including tributaries of the Yukon River and parts of the Seward Peninsula.

“Five years ago I would have told you that you were full of crap if you were suggesting that there were humans in Alaska or far Northeast Asia 20,000 or 25,000 years ago,” says Goebel. “But the more we hear from the geneticists, the more we really have to be thinking outside that box.”

Michael Waters, director of Texas A&M’s Center for the Study of the First Americans, which has found pre-Clovis sites in Texas and Florida, says Fedje and colleagues have come up with “a brilliant strategy” for finding game-changing artifacts where archaeologists have never searched. “It’s some of the most exciting stuff I’ve seen in years,” Waters says. “I’m rooting for them to find that early site.” ♦



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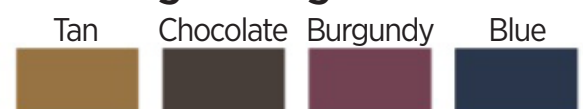
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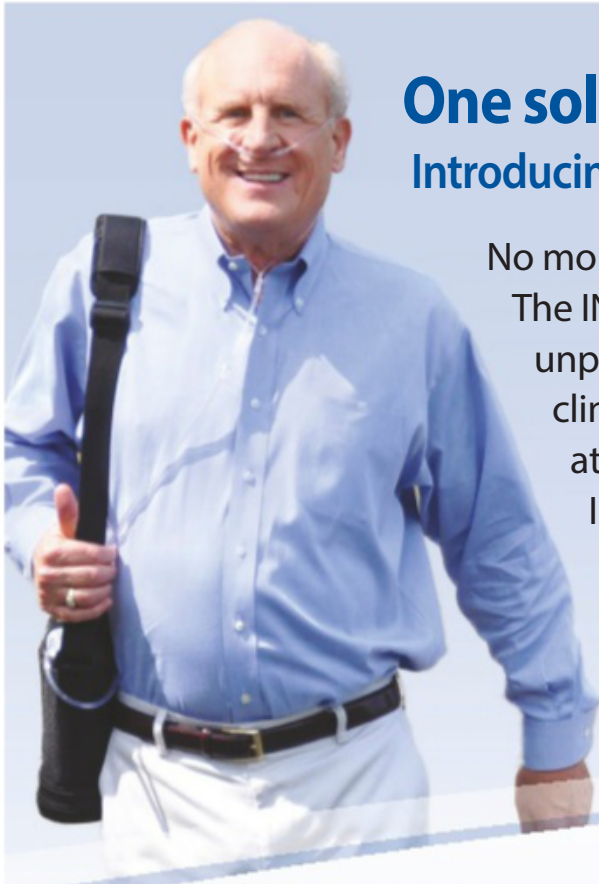


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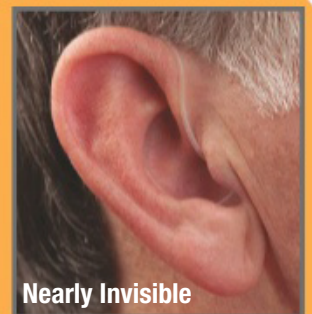
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The Frémonts

CONTINUED FROM PAGE 109

was 25 years old, starting a new life, shielded from the sun and rain by the colors of the flag.

JESSIE WAS ON DECK four days later when the *Panama* turned eastward toward the early morning light. It steamed between rugged mountains through the passage that her husband had named the Golden Gate. On the shoreline to the right was a presidio John had raided by boat in 1846, during the Mexican-American War, and just beyond it the little town of Yerba Buena, which many were calling by a new name, San Francisco. From the deck of the *Panama*, she found the town to be "a bleak and meagre frontispiece to our Book of Fate. A few low houses, and many tents, such as they were, covered the base of some of the wind-swept treeless hills, over which the June fog rolled its chilling mist."

But Jessie went ashore with a feeling of triumph and unsurpassable relief. On the way up the coast she had received glorious news: When a boat put ashore during a stop at San Diego, its crew brought back word that John was alive, and had been seen in Los Angeles, heading north. The rest of the way up the coast Jessie imagined him riding a parallel course up the interior. But he was not yet in San Francisco when she arrived. She managed to find a place to stay in one of the best houses in town, with a "beautiful garden kept in old-world order by a Scotch gardener." As the only woman, she was offered "the one room with a fire-place," a luxury in a town where, it was said, "there daily blows a hurricane."

As Jessie was arriving in San Francisco, John was approximately 200 miles southeast, in California's Central Valley. He was at the head of the remnant of his expedition, fewer than 20 men who had spent two months, from mid-February to mid-April, crossing the mountains and deserts to southern California. They passed near desert hot springs known as Agua Caliente, later the site of a town called Palm Springs. They reached a rancho controlled by an American outside Los Angeles. Some then broke off to seek their fortunes,

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while John gathered supplies from Los Angeles and continued north. Jackson Saunders, the black servant, was still with him, as was Preuss the mapmaker. John was also traveling with a large group of people he had recently met: men, women and children who were migrating from the Mexican state of Sonora, where they had worked in gold mines. Together, the group was heading toward a place called Las Mariposas, an enormous tract of land extending into the foothills of the Sierra Nevada, near Yosemite Valley.

John had bought the land from a former Mexican governor in 1847—although his claim might have surprised the Miwok Indians who lived there. The land was not settled by outsiders or even surveyed. It was believed to extend over 44,280 acres, or more than 69 square miles—an area more than three times the size of Manhattan, and slightly larger than the District of Columbia. It was pure speculation. “I had never seen the place,” John said, and he knew “nothing of its character or value.” When he met the Sonorans in the desert, he proposed a deal. They had mining skills; he had land. If they wanted to prospect on his property, John would split the proceeds. Twenty-eight accepted. Once enough fresh horses were in hand, John escorted them to Las Mariposas and left them to their work.

Next he went in search of Jessie. In mid-June, after nine months apart, the Frémonts finally reunited. They spent a few days in San Francisco, then left for the cleaner air of Monterey, a hundred miles down the coast, traveling in a new carriage John had ordered ahead of time. For some days the Frémonts explored the country, taking a kind of holiday and sleeping on the cushions of their carriage.

Then, while keeping their rooms in Monterey, they moved to San Jose, just south of San Francisco Bay, where John was setting up a sawmill machinery. He saw an opportunity: While it was a gamble to seek one's fortune by mining, there was a more certain income selling supplies to miners. Timber was wanted everywhere—for every new building, for underground mines, even for the creation of wood-plank streets in San Francisco. John soon had men hacking

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down enormous redwood trees to feed them into the whining saw.

He needn’t have bothered. Before long, a convoy of animals arrived, driven by the Sonorans from Las Mariposas. One animal bore a buckskin bag holding the first diggings. Examining it, Jessie believed it contained 100 pounds of gold, or maybe it was quartz shot through with gold: either way, a fortune. More bags soon arrived. Instantly, the Frémonts were rich—absurdly rich, so rich they hardly knew what to do, so rich they stopped trying even to keep track of their wealth. Jessie said the bags of gold “were put for safety under the straw mattress. There were no banks nor places of deposit of any kind. You had to trust some man that you knew, or keep guard yourself.” When possible, they shipped the bags to Monterey, where their fortune “accumulated in trunks in our rooms there.”

In the end, the Frémonts didn’t stay long in California, at least not this time around. In November, Californians elected a legislature, and in December the lawmakers met to elect two prospective senators, who would hurry to Washington, lobby for California statehood, and then take their seats in the Senate if successful. One of the men chosen was William M. Gwin, a former Mississippi congressman whose Southern roots would help allay the South’s fears of admitting a new free state to the Union. For the other seat, one name loomed above all others: John Charles Frémont, who, his fortune secure, had made it known that his brief hiatus from public life was over. John was elected easily, and when California was granted statehood the following September, he became one of the state’s first two senators.

On the final evening of 1849, John and Jessie departed on a steamship for Washington. “When we heard the steamer’s gun, New-year’s night, the rain was pouring in torrents, and every street crossing was a living brook,” Jessie recalled. “Mr. Frémont carried me down, warmly wrapped up, to the wharf, where we got into a little boat and rowed out. I have found that it changes the climate and removes illness to have the ship’s head turned the way you wish to go.” ♦

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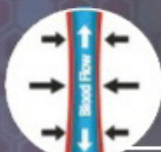
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Q: I've read that ostriches lay the biggest eggs. But what land bird lays the biggest egg for its body size?

Matthew Chase | Washington, D.C.

THAT WOULD be the North Island brown kiwi, says Kathy Brader, senior bird keeper at the National Zoo, which in 1975 bred the first kiwi outside its native New Zealand. A female kiwi lays an egg that is 15 to 22 percent of her weight. A male then incubates the egg for 68 to 91 days. When the chick hatches, it is soon self-sufficient and won't imprint on its parents. Unlike most birds, female brown kiwis have two functioning ovaries and, unlike other kiwi species, they will lay multiple eggs per season.

Q: Where does the phrase "lame duck" come from?

Anonymous | Boston

A **BRITISH ECONOMICS** term from the 18th century, it referred to someone going bankrupt. The term

was first applied to the presidency in the winter of 1928-9, as Calvin Coolidge waited out the end of his term. In 1933, the states ratified the 20th Amendment, or the "Lame Duck" Amendment, to shorten the time between the election and the inauguration. Claire Jerry, curator of political history at the National Museum of American History, suggests that the long wait time didn't suit an uneasy electorate in the midst of the Depression and underscored that the delay, originally put in place to account for the difficulty of traveling to the capital, had become outdated. President Franklin D. Roosevelt's first inauguration was the last to be held in March; his other three were in January.

Q: How many astronauts work for NASA and what do they do when they're not in space?

Anna Andrews | Walnut Creek, California

THE NUMBER FLUCTUATES, but there are currently 38 active astronauts. They spend their days training for future missions and developing hardware for new missions. Those heading to the International Space Station learn to use its equipment and learn Russian (they have to be fluent) at a training center outside Moscow. Some of the other astronauts are assigned to the two Commercial Crew vehicles being developed by Boeing and SpaceX for flight in 2020, says Mike Neufeld, senior curator at the National Air and Space Museum's Space History Department. And some are specializing in the Orion spacecraft and the hardware for the Artemis program to go back to the Moon. There are 16 astronauts no longer on flight status who hold administrative jobs at NASA around the United States.

Q: Why are there so many honeybees hanging around my swimming pool?

Bill Wacenske | San Diego, California

THEY MIGHT BE TRYING to cool off. When it's hot out, honeybees go searching for water; if they find it, they return to the hive and perform their waggle dance to communicate the water's location, says David Roubik, a research entomologist at the Smithsonian Tropical Research Institute. A group of 15 or so bees will fly there and lap up the water. Back in the hive again, they'll pass droplets to receiver bees, which deposit the water along the edge of the wax comb. Bees inside the hive will fan their wings and circulate the water-cooled air. This DIY air conditioning helps maintain the hive at what scientists say is the temperature honeybees prefer, around 95 degrees Fahrenheit. ♦

Text by Anna Diamond



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